QST

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amateur radio

January 1959
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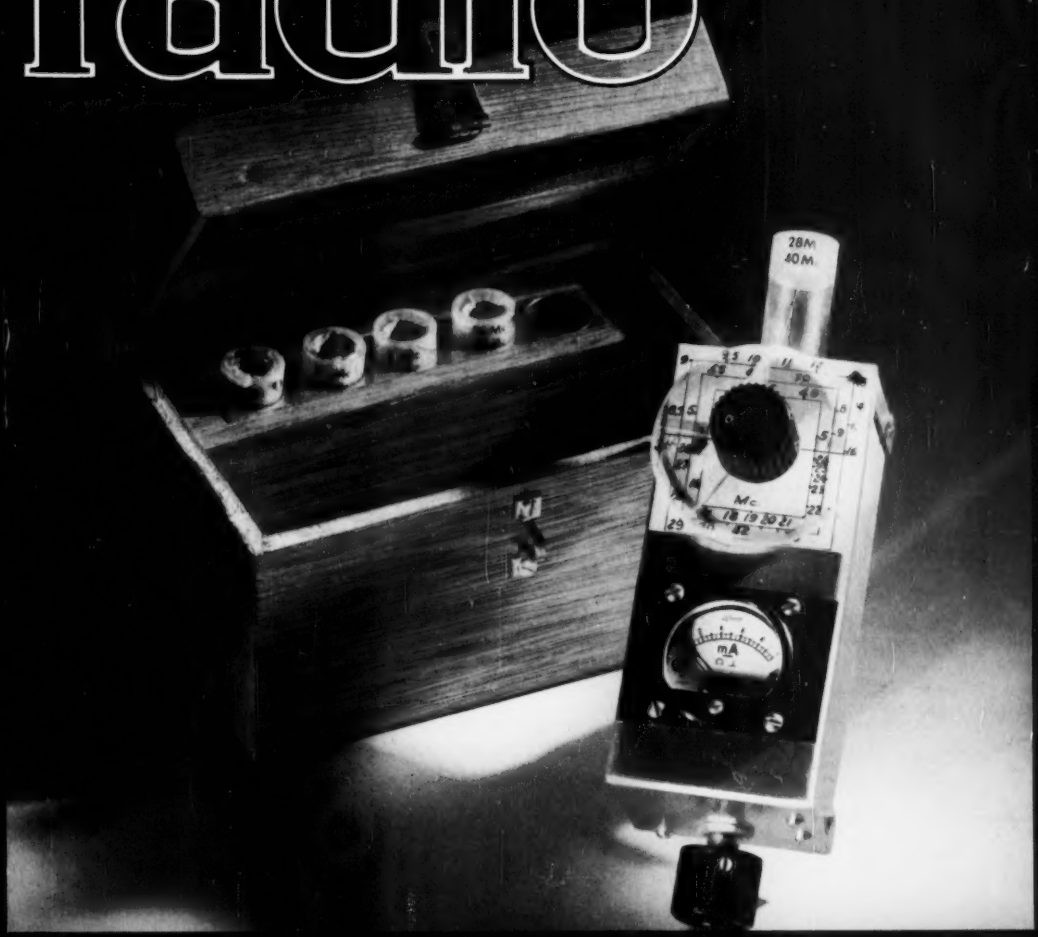
55c in Canada



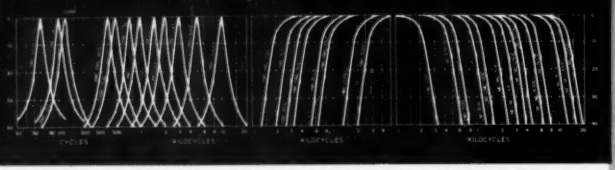
PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

FILTERS

FOR ALL APPLICATIONS FROM STOCK

HERMETICALLY SEALED TO MIL-T-27B & MIL-F-16327

UTC INTERSTAGE AND LINE FILTERS



This standardized group of filters covers most popular filter applications and frequencies. Units are in compact, drawn, magnetic shielding cases . . . 1 7/16 x 1 1/16 base, 1 3/8 high for BMI, LMI, BML; others 2 1/2 high. There are six basic types:

BMI band pass units are 10K input, output to grid, 2:1 gain. Attenuation is approximately 2 db at 3% from center frequency, then 40 db per octave.

HMI high pass units are 10K in and out. Attenuation is less than 6 db at cut-off frequency and 35 db at .67 cut-off frequency.

LMI low pass units are 10K in and out. Attenuation is less than 6 db at cut-off frequency and 35 db at 1.5 cut-off frequency.

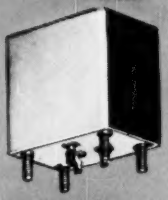
HML high pass filters are same as HMI but 500/600 ohms in and out.

LML low pass filters are same as LMI but 500/600 ohms in and out.

BML band pass units are same as BMI but 500/600 ohms input, output to grid, 9:1 gain.

STOCK TYPES
(number in figure is cycles)

BMI-90	BMI-10000	LMI-900	HML-300
BMI-100	BMI-200	LMI-1000	HML-900
BMI-120	HMI-500	LMI-1500	HML-1000
BMI-400	HMI-600	LMI-2000	HML-1500
BMI-500	HMI-900	LMI-2500	LML-1500
BMI-750	HMI-1000	LMI-3000	LML-2000
BMI-1000	HMI-2000	LMI-4000	LML-2500
BMI-1500	HMI-3000	LMI-5000	LML-4000
BMI-2000	LMI-300	LMI-10000	LML-9000
BMI-3000	LMI-400	BML-400	LML-10000
BMI-4000	LMI-500	BML-1000	LML-12000
BMI-5000		HML-300	



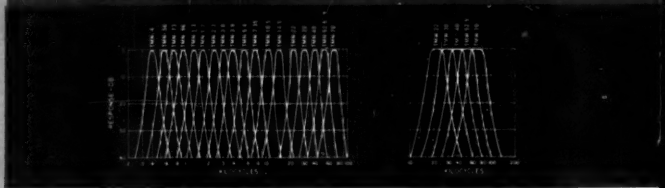
STOCK TYPES
(number in figure is KC)

TMN-.4	TMN-2.3	TMN-14.5	TMW-22
TMN-.59	TMN-3.0	TMN-22	TMW-30
TMN-.73	TMN-3.9	TMN-30	TMW-40
TMN-.96	TMN-5.4	TMN-40	TMW-52.5
TMN-1.3	TMN-7.35	TMN-52.5	TMW-70
TMN-1.7	TMN-10.5	TMN-70	

TMN-.4 thru TMN-1.7
5/8 x 1 5/8 x 2 inches
Weight ——3.5 oz.

TMN-2.3 thru TMN-70
5/8 x 5/8 x 1 3/4 inches
Weight ——1.2 oz.

UTC TELEMETERING BAND PASS FILTERS

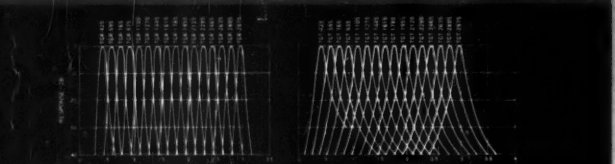


UTC standard telemetering filters provide extreme miniaturization with maximum stability, a complete set of 18 filters taking 19 cubic inches. They are 100K in and out and have an insertion loss of less than 6 db, 4 pin header for small Winchester socket.

TMN units are within 3 db at ± 7.5% of center frequency . . . down more than 18 db at ± 25% . . . more than 40 db beyond 1.75 and .58 center frequency.

TMW are within 3 db at ± 15% of center frequency . . down more than 20 db at ± 50% . . . more than 40 db beyond 2.5 and .4 center frequency.

UTC TELEGRAPH TONE CHANNEL FILTERS



These band pass filters for multiplex transmitting and receiving provide maximum stability in miniature sizes. Both receiving and transmitting types are 600 ohms in and out, and employ 7 terminal header for sub-miniature 7 pin socket.

TGR receiving filters are within 3 db at ± 42.5 cycles from center frequency . . . down more than 30 db at ± 170 cycles . . . down more than 15 db at adjacent channel cross-over.

TGT transmitting filters are within 3 db at ± 42.5 cycles from center frequency . . . down more than 16 db at ± 170 cycles . . . down more than 7.5 db at adjacent channel cross-over.

STOCK TYPES
(number in figure is cycles)

RECEIVING

TGR-425	TGR-1785
TGR-595	TGR-1955
TGR-765	TGR-2125
TGR-935	TGR-2295
TGR-1105	TGR-2465
TGR-1275	TGR-2635
TGR-1445	TGR-2805
TGR-1615	TGR-2975

TRANSMITTING

TGT-425	TGT-1785
TGT-595	TGT-1955
TGT-765	TGT-2125
TGT-935	TGT-2295
TGT-1105	TGT-2465
TGT-1275	TGT-2635
TGT-1445	TGT-2805
TGT-1615	TGT-2975

TGT CASE
1 1/2 x 1 1/2 x 2 1/2 in. 8 oz.

TGR CASE
1 1/2 x 1 1/2 x 4 1/4 in. 15 oz.

And Special Units to Your Specifications

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See the S/Line now, on display at your Collins distributor.

COLLINS

QST

JANUARY 1959

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4-65A Radial-Beam Power Tetrode

Smallest of the Eimac internal-anode tetrodes, the 4-65A has a plate-dissipation rating of 65 watts and is ideal for deluxe mobile as well as fixed-station service.

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4E27A/5-125B Radial-Beam Power Pentode

The Eimac 4E27A/5-125B is intended for use as a modulator, oscillator or amplifier. The driving-power requirement is very low, and neutralization problems are simplified or eliminated entirely.

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4CX1000A

4CX1000A Ceramic Power Tetrode

Specifically designed for SSB operation, the ceramic-metal 4CX1000A Class AB, linear-amplifier tube achieves maximum rated output power with zero grid drive.

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4CX250B Ceramic Power Tetrode

A compact, rugged tube unilaterally interchangeable in nearly all cases with the famous 4X150A, with the advantages of higher power and easier cooling.

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Driving Power	2.8w	2.1w	0
Input Power	500w	300w	500w

4-125A Radial-Beam Power Tetrode

The versatile tube that made screen grid transmitting tubes popular. This favorite for commercial, military and amateur use is radiation cooled.

	CW	AM	SSB
Plate Voltage	3000v	2500v	3000v
Driving Power	2.5w	3.3w	0
Input Power	500w	380w	315w

4-250A Radial-Beam Power Tetrode

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	CW	AM	SSB
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4CX300A Ceramic Power Tetrode

A new ceramic-metal high power tetrode designed for rugged service. Will withstand heavy shock and vibration and operate with envelope temperatures to 250° Centigrade.

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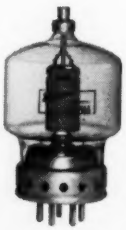

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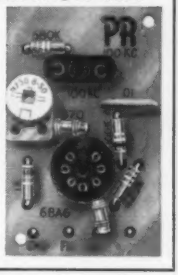

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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"It Seems to Us..."

THE YEAR IN REVIEW

As Father Time signs SK to the year 1958 let us pause briefly and let the outstanding events of the year, hamwise, pass in review. Leading the parade, in our view, is the public recognition accorded amateurs individually and collectively during the year. We call to mind the remarks of Vice-President Richard Nixon, OCDM Administrator Leo A. Hoegh, Secretary of Defense Neil McElroy, and a host of top military men at our National Convention in Washington last August (reported in detail in the October issue). Further, the Telecommunications Advisory Board of OCDM declared that ". . . the United States considers its own amateur service to be vitally necessary to the national defense and security because it provides a pool of personnel trained in the techniques of telecommunications, including skilled operators . . ." as reported in this department in May *QST*.

Also at the National Convention, each of the armed forces honored individual amateurs for particular service. Army awards went to W6KG, W9CYD, and W2KPQ: the Navy recognized W2VH, W8JYJ and K2KGJ; and W2IYX, W9NZZ and K4KCV received the Air Force's acclaim.

For providing communications for Cameron, Louisiana, after the disastrous hurricane in 1957, K5BQT was presented with the 1957 Edison Radio Amateur award on Feb. 27. Five hams were among the thirteen radio technicians cited in the All-American awards for public service, sponsored — as is the Edison award — by the General Electric Company: W4NSZ, W8NWO, W2EUI, K2BDQ and W5YIS.

Hams did some honoring themselves. The Annual ARRL Merit Award was presented to Paul Godley, ex-2ZE, for his pioneering work in receiver techniques and especially for his part in the Transatlantic Tests of the early twenties when, sponsored by the League, he made a trip to Ardrossan, Scotland, and proved for the first time that amateur signals on the then short-waves (200 meters) could cross the ocean from the United States to Europe.

The enthusiasm one develops for a hobby sometimes can favorably affect one's professional work. W3WV, a ham since 1905, was presented with the highest award the Navy gives its civilian employees, the Distinguished Civilian Service Award. In forty years as a Naval research worker, Leo has taken part in many important projects, including outstanding work in radar.

When an individual is so honored, the citation generally names a specific service performed by the ham. With commendations of the fraternity as a whole, however, the overall service-record of amateurs collectively is recognized. It is made up of such things as the amateur communications activities in 72 major and minor emergencies reported in *QST* during 1958. Hams were on the job for lost-person searches, forest fires, tornadoes, auto accidents, plane crashes, snowstorms, floods, and even stranded-animal rescues.

Another form of service was accomplished by the thousand-odd amateurs enrolled in the ARRL-IGY Propagation Research Project, collecting data on the more unusual forms of radio wave propagation. Then there were hams in the Southwest, making observations for the Air Force's artificial ionosphere project, Operation Smokepuff. Many tracked or made Doppler observations on the satellites launched during the year.

Still other v.h.f. enthusiasts have been pushing back the frontiers in other ways. Relatively simple equipment for 3500 Mc. was described in *QST* by W6BGK. A record 225-mile path was covered on 1296 Mc. on July 20 by W6MMU/6 and W6DQJ/6. The record lasted only until September 21, when W6MMU/6 and K6AXN/6 established a new 270-mile mark. 1958 also saw several firsts on 50 Mc., including the actual issuance of the first 50-Mc. WAC awards (although the work had been completed in 1957). The first VE8 activity and the first W1-KH6 QSO on 50 Mc. both took place during 1958.

On the lower bands, too, activity reached new highs. Proof is that WAS issuances are up 20% from last year, DXCC 25%, Phone-DXCC and WAC 43% — even more impressive when you realize that last year's figures also were all-time highs! Reported participation in contests, too, showed a substantial increase — both Field Day and the Sweepstakes were up about 12% from last year.

(Continued next page)

When it comes to regulations, however, the "market was mixed." On the up side were the new portable and mobile notification requirements; hams make an initial notification now for any operation for more than 48 hours away from home, but don't need to send further notices until there is a change in the information furnished to the Commission; or the operation continues for more than a year. The FCC commenced issuance of WA and WV calls in the second and sixth call areas, and prepared to issue them in the fourth, as the number of hams soared past the 190,000 mark.

The FCC and Interdepartment Radio Advisory Committee jointly recommended after months of study that the United States should take the position at the International Telecommunications Union conference in Geneva that no changes be made in amateur allocations below 220 Mc. At the same time, extensive changes in domestic assignments above 200 Mc. were made so as to provide badly needed space for the government radiopositioning service. While many non-government radio services lost space outright, the amateur bands were only slightly changed, but are now shared with the government's space-age electronic equipment.

On the down side was the Commission's action, effective in September, enlarging and revamping the Citizen's Radio Service; as part of that action the 11-meter band which amateurs had shared with industrial, scientific and medical service devices was withdrawn from amateur use and assigned to the Citizen's Radio Service. The Coast Guard expanded its loran operation, and in May it became necessary to delete shared use by amateurs of the 1875–1900 and 1900–1925 kc. segments, leaving 1800–1825 and 1975–2000 kc. for amateurs on the shared basis.

On the technical front, transistorized power supplies "came of age" during the year. Units capable of delivering over 100 watts were placed on the market — a power level which would have been thought impossible for transistors to handle only a short time ago. Kits for various kinds of amateur equipment made much greater use of etched circuits than heretofore. The first relatively high-performance receiver kits went into distribution during 1958. New circuitry for s.s.b. equipment appeared in *QST* and the manufacturers paid more attention to s.s.b. and d.s.b. reception in receivers marketed during the year.

We have already mentioned the growth in number of licenses and in on-the-air activity. The League's ranks also swelled during 1958, with our Full Membership now more than 70,000 and our total membership pushing rapidly toward the 100,000 mark. *QST* set another new record for size — the total for the year was 2232 pages, as compared with 2192 in 1957, and the December issue was a whopping 240 pages!

All in all, '58 was pretty great to us hams — and may '59 be just fine for all of us. QST

OUR COVER

The 1959 *Radio Amateur's Handbook* is now rolling off the press. Among the new equipment to be described in the latest edition is this neat transistorized grid-dip meter. Being completely portable, it contains its own power supply, and it operates from 3 Mc. all the way up to 40 Mc. It's a handy device for portable-mobile or antenna work as well as being useful in the home station too. Built by W1CUT.

Strays

The three men below (left to right: W9YCY, ex-W1OBZ, and KØCEC) are among the ten winners of the General Electric Company's 1958 All-American Awards program for television and electronics technicians who have performed outstanding community and public services. Their individual contributions were as follows. W9YCY quickly organized emergency rescue communications and worked his mobile rig for three days to speed relief when a tornado devastated western Wisconsin last June. Ex-W1OBZ has aided technical training programs in schools by donating radios and parts and by teaching Boy Scout classes in radio. KØCEC has conducted extra-curricular electronics courses in several Missouri schools and is active in many civic enterprises.

New Thresholds in V.H.F. and U.H.F. Reception

Devices and Diodes

BY ROSS BATEMAN,* W4AO, AND WALTER F. BAIN,** W4LTU

In DECEMBER *QST* [1] it was shown that, because of cosmic noise relationships, a reduction in receiver noise figure can result in quite large improvements in over-all sensitivity in the u.h.f. bands. In fact, it was determined that sensitivity at these frequencies can far exceed that obtained on two meters if one can approach an ideal receiver. If the previous article sold everyone on the idea that something worthwhile may be gained, then it is time to take a look at the devices that can accomplish this.

It might be well to first run through a qualitative discussion of the whys and wherefores of the newer low noise gadgets, leaving the gory details for a subsequent article. The lion's share will be devoted to reactance devices, as these seem most applicable for amateur use. Included will be a rundown of the various configurations that are possible — or impossible, as the case may be — and of the one critical component involved: the diode. This last item is of considerable interest to us, for if reactance devices are to find widespread use among amateurs they must be feasible with diodes of reasonable availability — and price! Tubes and mixer crystals will not be covered, as they should be old hat by this time.

Maser

The word maser stands for "microwave amplification by stimulated emission of radiation" (whatever that means). A brief, and perhaps oversimplified, explanation of maser action might be to visualize a situation in which an electron in a gas can exist, possessing either high or low energy, but no energy values in between. Consider a large number of such electrons, some with high and some with low energy, and expose them to a weak microwave signal which we are attempting to amplify. It will be found that the presence of the signal will "trigger" the electrons and cause many of them to change state, the low-energy ones picking up energy, and the high-energy ones losing energy. The net result will be essentially zero, because the energy given off will be just about offset by that picked up. All that comes out will be what is left over from the input signal, unamplified.

However, if all the electrons are in the high-energy state when the weak triggering signal is applied, the electrons can go in only one direction — lower in energy. Net energy is given up (controlled by the weak input signal), and appears in the output as an amplified signal — just what was wanted. How do the electrons get into the high energy state to begin with? Simply by the application of a continuous high-power signal which forces them there. This signal is called the "pump" and, if continuously applied, will return the electrons to the high-energy state each time they are triggered down. Thus, it is the pump which supplies the power for the amplification process, much as a d.c. source supplies it for tube amplifiers.

What, then, are the drawbacks involved in the maser? In order to obtain the required electron behavior, it is necessary for the device not only to be in a strong magnetic field, but its electrons must be those within certain gases, or substances such as ruby or garnet. This could get expensive. Perhaps the most discouraging thing, however, is that to obtain low-noise operation with the maser, it must be cooled to very low temperatures by liquid nitrogen, a commodity not found in many hamshacks!

Traveling-Wave Tube

Another device finding application in the field of low-noise amplification is the traveling-wave tube or t.w.t. Oversimplifying again, it may be considered to consist of a focused beam of electrons traveling down a space surrounded by an r.f. transmission line whose velocity of propagation is slowed to about the same speed as that of the electrons. A weak signal put into this transmission line at the cathode end will modulate the electron beam, the amount of modulation "piling up" and becoming greater the longer the beam and the wave travel together. At the end of the tube, the beam is well modulated and r.f. may be extracted from it at a fairly high level — amplified. Since it is a high-vacuum beam tube, it is not likely to find wide amateur use until it appears on the surplus market. However, it could be very useful, as it will provide an easy 30 db. gain over a 2:1 frequency range without tuning. High-level t.w.t.'s can give 1 kw. c.w. output with no strain.

A close cousin of the t.w.t. is the backward-wave amplifier. It is similar, except that the amplified output is taken from the input end. You figure that one out!

Reactance Devices

Finally, we come to the particular devices which appear to hold the most promise for amateur use. Reactance devices are known by a variety of aliases, some of the more common being "mavar" and "parametric amplifier." Throughout this discussion, "reactance device" will be used as a general term — it is probably a

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[1] Bateman and Bain, "New Thresholds in V.H.F. and U.H.F. Reception — The World Below KTB" *QST*, Dec. 1958.

little more indicative of how they operate. The term mavar (microwave amplification by variable reactance) is not entirely appropriate for v.h.f. application, and who knows what "parametric" means?

Actually, there is already a rather large family of the devices, some members of which function as frequency converters and others as amplifiers. There are two simple analogies which can be used in a general way to demonstrate their operation. First, consider a simple tuned circuit, such as is shown in Fig. 1. If a weak r.f. signal is present in the circuit, and the plates of the capacitor are pulled apart each time the signal reaches a peak,

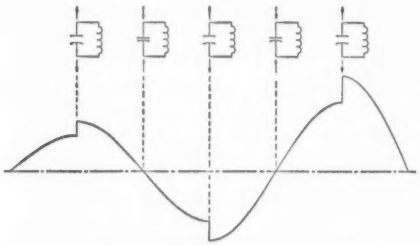

Fig. 1—Amplifier analogy of a pumped circuit. As the capacitor plates are alternately moved apart and toward each other by the pumping frequency, increments of energy are added to the signal as shown by the curve.

and pushed together each time the voltage goes through zero, the weak signal will be boosted on each cycle and come out amplified. It is evident that the source doing the pushing and pulling on the capacitor plates must do so at twice the signal frequency and that it is supplying the additional energy which appears in the tank. It expends energy moving the plates when they are charged (at time of peak signal voltage), but does not regain any energy as the plates are pushed together at a time of zero charge.

It will also be evident to the discerning that, if the pumping voltage occurs out of phase, the signal will be kicked *down* on each cycle and de-amplified — this we scarcely need! Is there, then, a phase problem and must the pump be properly synchronized with the signal? Fortunately, the answer is no. In the practical versions, this phase problem does not arise.

If the above analogy didn't put it across, let's try a simpler but less rigorous one. It consists simply of a variable air capacitor through which is passing a continuous r.f. current. When the plates are fully closed, a large current will be passed. When they are fully open, a small current is passed. If the rotor is now varied between these two values (driven by a weak input signal), it is evident that the current flowing will be amplitude-modulated at the frequency of the capacitor variation — see Fig. 2. Assuming that the rotor is essentially frictionless, then no energy is required to control the large current and we have obtained power gain and frequency conversion of the rotor-driving signal.

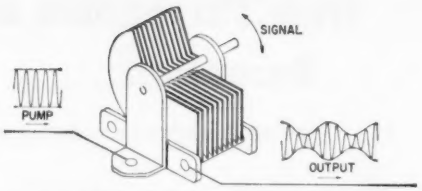

Fig. 2—Rotating capacitor analogy of the up-converter. Rotation at signal frequency varies the reactance of the capacitor and causes the pump frequency to be modulated.

It is of interest to draw a similar analogy for an ordinary crystal mixer. It would be represented not as a variable capacitor passing a large r.f. current, but rather as a rheostat. When varied, it, too, would modulate the large signal (local oscillator) at the small signal rate but, by its very nature, would be a lossy device and thus could not be expected to provide gain — and it doesn't.

Hence, it appears that potentially we have the type of device desired — one which gives gain — if we can but provide a component similar to the air capacitor above, but whose capacitance can be varied at a radio frequency rate. Under proper operating conditions, a semiconductor diode fulfills this requirement.

The Critical Component

Common diodes are composed of silicon or germanium in either a point-contact or junction configuration. The junction diodes merit some special attention since they appear to be more useful (as well as being simpler to explain).

Both silicon and germanium can exist in two separate forms, p-type and n-type. The p-type contains free positive charges, while the n-type contains free negative charges. If a lump of p-type is joined tightly to a lump of n-type, we have a junction diode. Application of negative voltage to the "n" side and positive to the "p" side will repel the free charges from the diode terminals and cause them to move toward the junction boundary. This effects a net exchange of charge, i.e., forward conduction. If the applied voltages are reversed, the free charges will be drawn away from the junction boundary, leaving a neutral region (called the depletion layer) and no net exchange of charge is possible; hence, high back-resistance.

It is this condition of back bias that is of interest. The depletion layer can be considered to

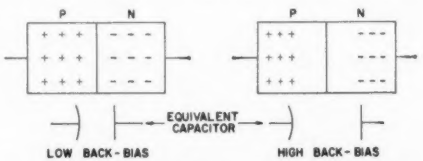

Fig. 3—Diode capacitor behavior. A change in back-bias voltage changes the width of the depletion region, effectively changing the spacing between the two groups of charges that form the "plates" of the capacitor.

be a dielectric (it has no free charges), and the regions outside it to be conductors (they contain free charges). These two regions each side of the depletion layer act as the plates of a capacitor — a capacitor whose plate-spacing and, hence, capacitance, is dependent upon applied back-voltage. Fig. 3 shows the depletion layer spacing for two conditions of back bias — low voltage for narrow spacing and high capacitance, and high voltage for wide spacing and low capacitance.

Frequency Converters

For our purposes, the reactance devices can be broadly classified as up-converters, down-converters, and amplifiers. Frequency converters will be discussed first because, as will be seen, even the amplifying arrangements generate additional frequencies by conversion processes. Frequency relations and "idealized" gains for up-converters are shown in Figs. 4A and 4B, and for down-converters in Figs. 4C and 4D. The term "idealized" has been applied to the gain equations for two reasons. Actually, the gain (or loss)

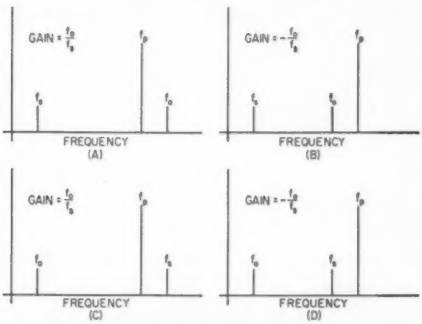

Fig. 4—Frequency relationships in up- and down-converters. The signal frequency is f_s, pump frequency is f_p and output frequency is f_o.

may be almost anything depending on operating conditions. Also, the minus signs for the "gains" in Figs. 4B and 4D indicate that the configuration is regenerative. For these cases, very high regenerative gains may be obtained, but accompanied by narrow bandwidth and instability.

The electrical circuits are fairly simple. Fig. 5 shows the basic elements for a generalized circuit applicable to amplification or conversion. The three tanks are tuned to the signal frequency, f_s, the output frequency, f_o, and the pump frequency, f_p. The frequency f_p is supplied from an external pump oscillator. In case you are wondering about the peculiar-looking capacitor which tunes the pump tank, it is just the back-biased crystal diode discussed above. The circuitry for introducing bias is omitted in the interests of simplicity.

Now let's see what happens when this diode is pumped at f_p and operated as an up-converter. Assume for the moment that the signal-frequency tank circuit in Fig. 5 is tuned to 100 Mc., and that the pump and output tanks are tuned to 260

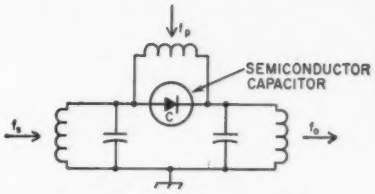

Fig. 5—Generalized two-tank circuit.

and 360 Mc., respectively. When power is applied to the pump tank, the diode capacitance will vary at the pump frequency rate around the capacitance value associated with the particular value of reverse bias voltage which has been applied. The effect of the varying capacitance is to permit some of the pump power to be released to the signal and output tanks. For this example, this pump energy is most effectively utilized in converting an applied 100-Mc. signal to a higher-power replica of the signal at a frequency of 360 Mc. The frequency relations for this example are shown in Fig. 4A.

Except for two important differences, the conversion process is similar to that which occurs when the diode is operated as an ordinary crystal diode mixer. In the first place, a pure reactance generates no thermal noise, and to the extent that the diode is a pure capacitance it can contribute no noise. However, an ordinary crystal mixer generates thermal noise and additional noise from shot-current effects. Secondly, when operated as a variable capacitance, a power gain can be realized, while the conventional crystal mixer dissipates both signal and injection power. The output power from such a mixer is always less than the signal input power.

Amplifiers

Fig. 6 shows one of the ways in which straight-through amplification can be achieved. There the circuit of Fig. 5 has been "folded over" and one tank now serves for both the input and output

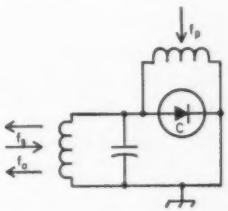

Fig. 6—The single-tank amplifier.

frequencies. The frequency relations for this configuration are shown in Fig. 7, along with a selectivity curve for the single tank. With this arrangement, which is based on having the pump frequency approximately equal to twice the signal frequency, an amplified version of the signal at f_s, and a difference frequency, f_o, equal to $f_p - f_s$, appear in this tank. Thus, the circuit is functioning simultaneously as an amplifier or converter, depending on whether f_s or f_o is utilized. If the

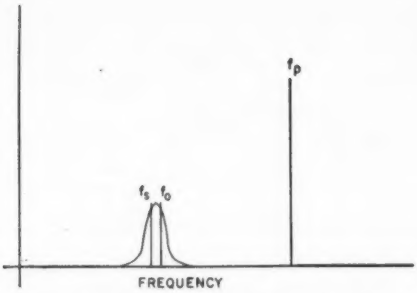

Fig. 7—Frequency relationships in the single-tank amplifier.

circuit is working properly with reasonable gain, each input signal, f_s, has a "twin brother" at f_o having approximately the same strength. This could result in some confusion (and interference) when the band is wide open, since both f_s and f_o appear at the output terminals.

This and other problems associated with the single-tank amplifier can be resolved by moving

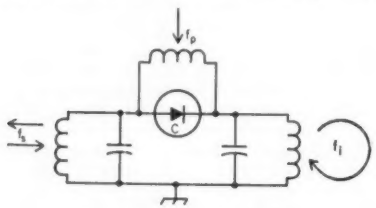

Fig. 8—The two-tank amplifier.

f_p to a considerably higher frequency. This also moves the bothersome twin, f_o, higher. Unfortunately, however, the circuit will not provide gain when operated in this condition until a resting place has been found for the "twin." This is provided by simply inserting in the circuit of Fig. 6 a tank (tuned to f_o), in which f_o can be dumped and rendered harmless. Since f_o and its tank serve no useful purpose except to allow the circuit to work, the nomenclature "idler frequency," f_i, and "idler tank" appear appropriate. See Fig. 8. The frequency relations for this circuit are shown in Fig. 9. Note that the resulting circuit of Fig. 8 is identical electrically to that of Fig. 5. However, its method of operation is fundamentally different — but this is a matter which can be dealt with later.

Up to now, the discussion has been along qualitative lines, intended to provide background for a more rigorous and detailed article to follow, covering both circuits and diodes. Much of the material presented above has been derived from the two papers [2,3] referenced below. These should provide an adequate supply of homework for those who might be so inclined and can't wait for the next installment.

[2] H. Heffner and G. Wade, "Gain, Bandwidth, and Noise Characteristics of the Variable Parameter Amplifier," *Journal of Applied Physics*, Vol. 29, No. 9, September, 1958.
[3] A. Uhlir, Jr., "The Potential of Semiconductor Diodes in High-Frequency Communications," *Proc. IRE*, Vol. 46, No. 6, June, 1958.

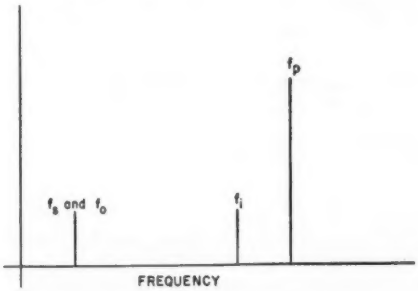

Fig. 9—Frequency relationships in the two-tank amplifier.

Strays

The Office of Civil & Defense Mobilization in Battle Creek, Mich., is looking for several Communications Specialists (in both administration and operation), with pay ranging from $3880 to $9530. Applicants should have a history of at least six years of progressively more responsible work in the field of communications. For further information contact the Director, Administrative Office, OCDM Region 4, Battle Creek, Mich.

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Additions and corrections to the world-wide listing of QSL Bureaus in December *QST*:
Philippine Islands: Romeo F. Castaneda, Philippine Assn. for Radio Advancement, 67 Espana Extension Street, Quezon City.
Burma: Tara Singh, 187 Eden Street, Rangoon, Union of Burma, Asia.
Morocco: (Military Personnel): USAFE QSL Service, APO 118, Box 80, New York, N. Y.

—···—

Robert Kimmel, W9MMY, and Robert Kimmel, KN9MXM, took FCC exams at Fort Wayne, Ind., on Nov. 4 in the same room at the same time. They are not related and had never met before.

—···—

Another five-ham family — W5HRQ, W5HCC, W5HCE, W5HRP and W5GJH.

—···—

One of the students at RPI (Rensselaer Polytechnic Institute) is K2RPI.

—···—

Another "club with the longest name." The United States Air Force Academy Cadet Amateur Radio Club.

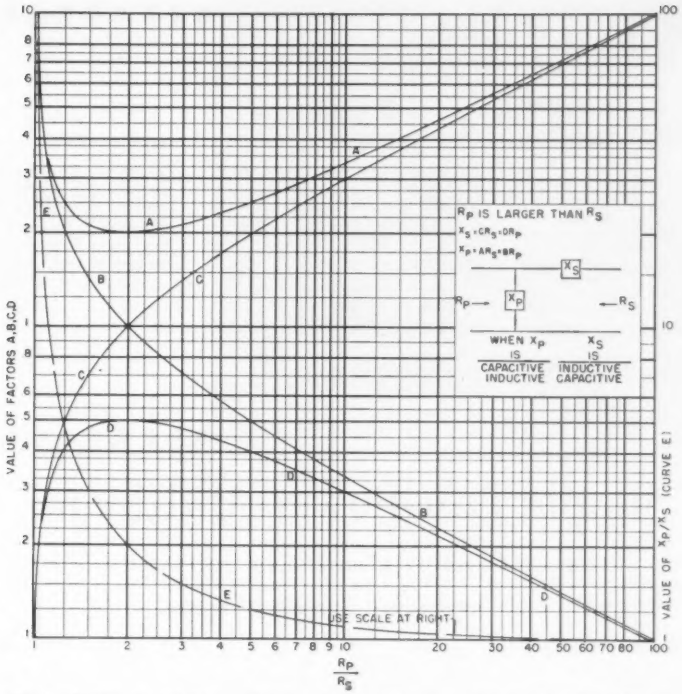

VALUE OF FACTORS A,B,C,D
VALUE OF X_p/X_s (CURVE E)
$\frac{R_p}{R_s}$
USE SCALE AT RIGHT
R_p IS LARGER THAN R_s
$X_s = CR_s = DR_p$
$X_p = AR_s = BR_p$
WHEN X_p IS CAPACITIVE INDUCTIVE
X_s IS INDUCTIVE CAPACITIVE

Fig. 1—Factors for obtaining series and shunt reactances for L nets to match resistances having ratios (R_p/R_s) from 1 to 100.

Painless "*Q*-Less" L Networks

Easy Calculations for Impedance Matching

BY R. K. GHORMLEY*, WØUPH

Don't let the graph on this page scare you. By using it, impedance-matching problems are reduced to simple arithmetic.

THE L network is a handy gadget for matching two unequal resistances.[1] This presentation shows you an almost painless method of knowing how big to make what if you happen to be needing one.

Furthermore, in spite of what George said, you and I will not even mention *Q* in the process. That must make it "*Q*-Less"! (I'm just kiddin'.)

To design an L net, let Fig. 1 do most of your work. That picture presents curves which allow obtaining either arm of an L network in terms (a) of the other arm or (b) of either of the resistances being matched.

Let me hasten to say that the information of Fig. 1 is a different way of reaching the same answers as would be attained using the roads followed in the Grammer articles. Fig. 1 does go a little farther, however, by giving two choices for obtaining the series and shunt arms.

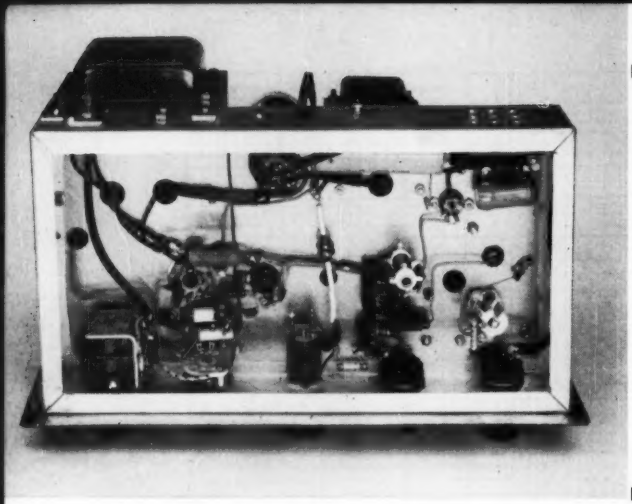
Fig. 1 also handles the situation where you have a network in hand and wonder what it's good for. Just find the ratio of X_p to X_s, and enter Fig. 1 on Curve E. It will reveal the R_p/R_s for which that particular net works. Curves A, B, C, D will then allow finding R_p and R_s.

To step up impedance, the input voltage is connected across X_p; to step down impedance, the input voltage is connected across the opposite end of the network. As Fig. 1 notes, if X_s is capacitive, X_p must be inductive and vice versa.

(*Continued on page 158*)

* 720 South 33rd St., Lincoln, Nebraska.

[1] Grammer, "Simplified Design of Impedance-Matching Networks" (Part I — "Basic Principles and the L Network"), *QST*, March, 1957.



This bottom view shows components underneath the chassis. The variable capacitor to the right is the v.f.o. band-set capacitor. The slug-tuned coil in the plate circuit of the v.f.o. is to the left. The bleeder and VR-tube resistors are in the upper right-hand corner.

A Simple Low-Power Multiband Rig

Easier Construction Using Subassemblies

BY ERNEST A. COONS,* WIJLN

Until I built the little portable rig recently described in *QST*,[1] it had been a long time since I had run low-power c.w. I had forgotten that there is more fun working them QRP than by hitting them with a kilowatt. However, after using the portable a few times on my regular antenna, I decided that one band was not enough for getting the most out of a home station. I wanted multiband operation and without too much complication.

I couldn't remember seeing anything published recently that might be suitable. Anyway, I like to work them out myself. V.f.o. is a must these days, of course, if the low-power fellow is to get out from under the big signals when they take over. Bandswitching is nice, too, and is actually less complicated than a mess of plug-in coils. I remembered seeing some small preassembled multiband tank circuits advertised in *QST*[2] and these units make the job easy. No chasing around for parts, winding coils, or assembling switches. Everything you need is there in one small unit ready to mount. The same outfit also makes a prewound v.f.o. coil on a threaded ceramic form.

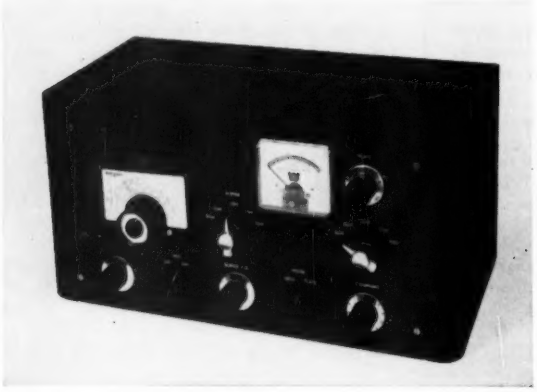
Circuit

The transmitter has only three stages, as

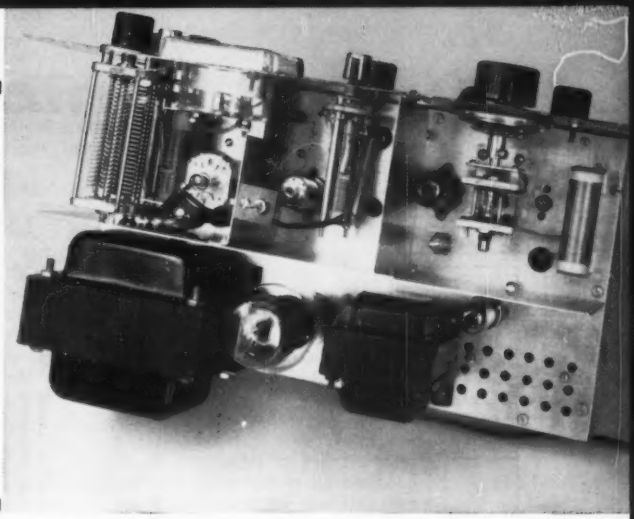
* 25 Atlantic Terrace, Lynn, Mass.

[1] Coons, "Power 25 Watts — Fun Unlimited," *QST*, July, 1958.

[2] Harrington Electronics, Topsfield, Mass.



This 30-watt rig has a built-in v.f.o. and band-switching with pi-network output. Controls along the bottom of the panel, from left to right, are for the power switch, v.f.o. set, multiplier tuning, meter switch and output coupling. The amplifier tuning control is to the right of the meter.



Looking down into the "works," we see the final stage and meter to the left, the buffer/multiplier and neutralizing capacitor near the center, and the v.f.o. to the right. The screwdriver adjustment for the band-setting capacitor is between the v.f.o. coil and tuning capacitor. The slug-adjusting screw for the v.f.o. plate coil is to the rear of the v.f.o. tube. Power-supply components are in the foreground.

shown in the diagram of Fig. 1. There is a 6CL6 v.f.o./multiplier, a 5763 buffer/multiplier and a neutralized final using a 6DQ6GA that works straight through on all bands. The v.f.o. circuit is series-tuned and it operates at 3.5 Mc. C_1 is the tuning capacitor, C_2 the band-setting capacitor and C_3 a fixed padder. Plate and screen voltages are regulated by the 0A2. A slug-tuned coil and a 100-$\mu\mu$f. fixed capacitor in the plate circuit of the oscillator tune the circuit to 7 Mc. In spite of this, sufficient 80-meter energy gets through to the grid of the 5763 to supply adequate drive to the final on this band. This eliminates switching in the oscillator plate circuit.

A Harrington Electronics type GP-20 assembly is used in the plate circuit of the multiplier, and a type GP-50, pi-network connected, is used in the output circuit. The loading capacitor C_{14} is a triple-gang broadcast-replacement type variable having about 365 $\mu\mu$f. per section. The third section is used on 80 meters only. Since the coupling links of the GP-50 unit are not needed in this application, the switch wafer that normally handles the link connections can be used to switch in the third section of C_{14} in the 80-meter position.[3]

To get good keying characteristics, only the final amplifier is keyed — in the cathode circuit. S_1 cuts off the v.f.o. and buffer stages during receiving intervals and, when closed, permits setting the v.f.o. to frequency.

The milliammeter M_1 may be switched to read either final grid current or final cathode current. The shunt R_1 increases the full-scale reading to 10 ma., while R_2 increases it to 200 ma. The makers of the meter[4] can supply a full line of shunts to provide any full-scale reading desired. (Also, see measurements chapter of *ARRL Handbook*.)

The power supply is quite conventional. With the single-section choke-input filter, the output voltage under full load is about 275.

[3] The 80-meter position of S_{2A} is open. As an alternative, C_{14C} can be connected to this point instead of to the link switch. — *Ed.*

[4] Waters Mfg. Co., Wayland, Mass.

Construction

I don't feel that it is necessary to go into too much detail about the construction of the rig, for if you are going to build it you must like to work things out for yourself, otherwise you would be putting together one of the kits on the market. I enjoy building things myself. I get a big kick out of working out something that is a little different from what I have seen in print, and getting it to work sometimes as well as, and sometimes better than, commercial rigs or kits. That, to me, is a big part of ham radio.

The unit is housed in an $8 \times 8\frac{1}{4} \times 16\frac{1}{2}$-inch cabinet (Bud C-1748) having an 8×14-inch panel. The chassis, on which most of the components are mounted, is of aluminum and measures 7 inches by 13 inches by 2 inches deep. The pictures show the general arrangement quite clearly. To bring the bottom controls up to a convenient level, the panel is fastened to the chassis with its lower edge extending $\frac{1}{2}$ inch below the chassis.

The r.f. stages are lined up along the front portion of the chassis, while the power supply occupies the rear. Interstage shielding was installed in a very simple manner. One piece of aluminum 5 inches high was run the whole length of the chassis between the r.f. and power-supply sections. Then smaller pieces were cut to isolate the oscillator from the multiplier and the multiplier from the final. A notch must be cut out of the latter piece to clear the meter. The shields were fastened to the chassis with spade bolts.

The Harrington tuning units come mounted on small aluminum panels. To conserve space, these panels were removed and the units mounted directly on the front panel of the cabinet.

The neutralizing capacitor C_{12} must, of course, be insulated from ground. This was done by first mounting the capacitor on a piece of bakelite 1 inch square, and then fastening the bakelite piece to the interstage shield with a small aluminum angle. You may think of an easier way.

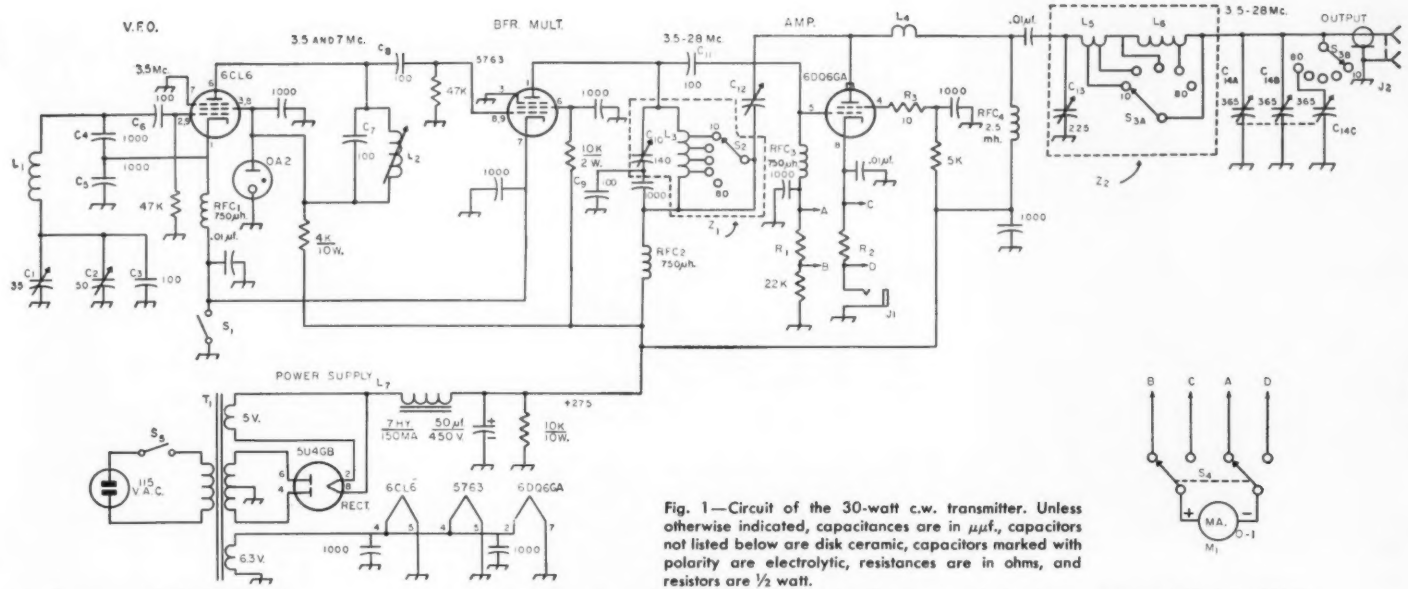


Fig. 1—Circuit of the 30-watt c.w. transmitter. Unless otherwise indicated, capacitances are in μμf., capacitors not listed below are disk ceramic, capacitors marked with polarity are electrolytic, resistances are in ohms, and resistors are ½ watt.

C_1—Tuning capacitor (Millen 21035).
C_2—Air trimmer (Hammarlund APC-50).
C_3—NPO ceramic.
C_4, C_5—Silver mica.
C_6, C_7, C_8, C_9 C_{11}—Mica.
C_{10}—140-μμf. midget variable.
C_{12}—Neutralizing capacitor (Erie 532-10 tubular variable).
C_{13}—225-μμf. midget variable.
C_{14}—Triple-gang broadcast-replacement variable, 365 μμf. per section, sections C_{14A} and C_{14B} connected in parallel).
J_1—Open-circuit key jack.
J_2—Coaxial receptacle (SO-239).
L_1—17 μh.—50 turns No. 24, ¾-inch diam., 1¾ inches long on threaded ceramic form (Harrington Electronics XL-1 coil).
L_2—Approx. 4 μh.—35 turns No. 26 enameled on ⅜-inch iron-slug form (Waters Mfg. Co. CSA-1011-2 form).
L_3—Same as L_1, tapped at 5, 8, 13 and 25 turns from top end.
L_4—6 turns No. 16, ¼-inch diam., turns double-spaced.
L_5—14 turns No. 16, ¾-inch diam., 2 inches long, tapped at 5 turns and 9 turns from L_6 end.
L_6—38 turns No. 22, ¾-inch diam., 1½ inches long, tapped at 26 turns from C_{14} end.
L_7—7-hy. 150-ma. filter choke (Stancor C-1710).
M_1—0–1 d.c. milliammeter.
R_1—10-ma. meter shunt (see text).
R_2—200-ma. meter shunt (see text).
RFC_1, RFC_2, RFC_3—750-μh. r.f. choke (Waters or National).
RFC_4—2.5-mh. r.f. choke.
S_1, S_5—S.p.s.t. rotary switch (Clarostat 8590).
S_2, S_3—Single-pole, 5-position ceramic rotary switch.
S_4—D.p.d.t. phenolic or ceramic rotary switch (Centralab PA-1003 or 2003).
T_1—Power transformer: 800 v. c.t., 200 ma.; 5 volts 3 amp.; 6.3 volts 5 amp.
Z_1—Preassembled multiband tank circuit (Harrington Electronics GP-20).
Z_2—Preassembled multiband tank circuit (Harrington Electronics GP-50).

Note: The GP-50 unit comes wired as a parallel-tuned tank circuit. For pi-network use, the connection between the rotor of the tuning capacitor (C_{13}) and the switch must be broken. The rotor of the capacitor then goes to ground, and the switch terminal to C_{14}. The link coils and switch are not used.

Because of restricted space, the power transformer must overhang the rear of the chassis. The transformer shown is the "shell" or "flush-mounting" type with auxiliary brackets for upright mounting. The rear mounting bracket was not used, and straps of aluminum under the core bolts were used to fasten the rear of the transformer to the back wall of the chassis, as shown in the bottom view. In a case where a standard upright transformer is used, angle pieces can be made to support the rear of the transformer at the mounting holes, the angle pieces being fastened to the rear of the chassis.

The holes in the right rear corner of the chassis (bottom and top views) are to provide some ventilation for the bleeder and VR voltage-dropping resistors underneath.

Testing

First check out the power supply with all tubes removed except the rectifier. If you have a voltmeter, it should read in the vicinity of 350 when connected across the 10K 10-watt bleeder resistor. When the 0A2 is plugged into its socket, it should show a fairly bright glow.

Now check the v.f.o. frequency by listening on a receiver. With the 6CL6 in its socket, and S_1 closed, adjust C_2 with a screwdriver (preferably an insulated one) until the v.f.o. signal is heard at 3500 kc. with C_1 set at maximum capacitance. If a metal screwdriver is used, the frequency may change when it is brought near the coil, and allowance for this will have to be made.

Now temporarily disconnect the lead that goes from the power supply to the 5K resistor and r.f. choke RFC_4 in the amplifier circuit. (CAUTION: Be sure that the power switch is turned off!) Make certain, however, that the supply is still connected to the two preceding stages. With the 5763 plugged in, the meter switched to read amplifier grid current, the two band switches turned to their 10-meter positions, and the key closed, the slug of L_2, and capacitor C_{10} should be adjusted more or less simultaneously to produce a maximum grid-current reading. When this adjustment has been found, with the key still closed, C_{14} should be set with the plates about quarter meshed, and then C_{13} should be slowly turned through its range. At some point near minimum capacitance, there will probably be a flicker in the grid-current reading. C_{12} should then be adjusted very carefully until the flicker in grid current as C_{13} is turned disappears. This neutralizing adjustment, once made, should hold for the other bands. The plate voltage may now be reconnected to the amplifier. (Again, turn off the power supply first!)

A 25-watt lamp connected across the coax output connector makes a suitable dummy load for trying out the amplifier. Starting out with the band switches thrown to their 80-meter positions and the meter switched to read cathode current, set C_{14} at maximum capacitance. Turn on the power supply, and shortly after, close the key. Turn C_{13}, watching the meter for a dip in the plate-current reading. Set C_{13} at the point where the current is lowest. This point should come with the plates of C_{13} almost fully meshed. Then decrease the capacitance of C_{14} a little and repeat the process. As C_{14} is decreased, the current at the lowest point of the dip should increase and the load lamp should begin to light. C_{14} should be adjusted to the point where the lamp lights brightest when C_{13} is adjusted for the dip in plate current. This dip will become less pronounced as the lamp takes more power from the transmitter. This process of loading the amplifier may be carried on up to the point where the cathode current at the dip point is 125 ma. However, with the lamp load it may not be possible to bring the current up to this value, especially on the lower-frequency bands. With a low-impedance antenna load, however, it should be possible to load the amplifier so that the cathode current at the dip point will be 125 ma. The input to the final will then be approximately 30 watts. Tests with the dummy load show that it is possible to overdrive the 6DQ6GA; that is, the output does not increase and may, in fact, decrease, with a grid current exceeding 2 ma. Therefore, C_{10} should always be adjusted to produce a grid current reading of about 2 ma. with the final fully loaded.

After you have satisfied yourself that the transmitter is working as it should on all bands, an antenna may be substituted for the dummy lamp. The settings of C_{13} and C_{14} may be different from those found best when using the lamp, but the procedure will be the same. The output circuit is designed to work into a low-impedance load, i.e., an antenna system fed by 50- or 75-ohm coax or twin line. However, under some circumstances, but not all, you may find it possible to load the amplifier using other types of antennas. Simple multiband antennas using low-impedance feed are the parallel-dipole and trap-dipole antennas. Parallel dipoles are discussed in the ARRL *Handbook* and trap antennas are described in *QST* for March, 1955, and October, 1958, and are also available on the market. QST

NEW FORM FOR CAP SATELLITE BROADCASTS

The anticipated change-over to the new compact form of satellite predictions as broadcast by Civil Air Patrol radio stations took place in mid-November. Modified orbital elements for 1958 Alpha, Delta I, Delta II, and Epsilon are now regularly transmitted at the same times as the earlier-type predictions. The orbital data can be utilized as described in the booklet "*Simplified Satellite Prediction from Modified Orbital Elements*," reviewed in November 1958 *QST*, page 186. It is expected that the data will be revised twice weekly, as normal procedure, so that accurate orbital information for both visual and radio observers will be continuously available.

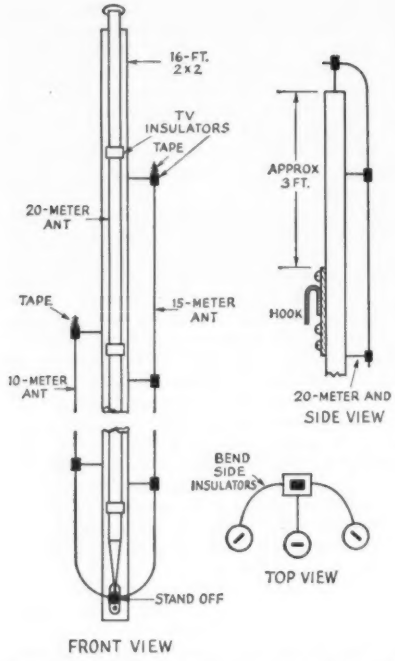


Fig. 1—Sketch showing construction of the "Impromptu" three-band ground-plane antenna. Radiator elements are of 300-ohm Twin-Lead on TV stand-off insulators, fastened to a 16-foot 2 × 2. Radiator and radial lengths are 16 feet 6 inches for 20 meters, 11 feet 2 inches for 15, and 8 feet 3 inches for 10 meters.

The Impromptu Ground Plane

By DONALD MIX,* W1TS

Three-Band Vertical for a Few Bucks

As the title suggests, this ground plane for 20, 15, and 10 was intended originally only as an expedient when a multiband antenna of some sort was needed in a hurry. But it has worked so well that it will probably be some time before it is replaced. It was in operation within a few hours after it was started. By including the coax feedline as part of the radiator, it has also done a creditable job on 40 and 80 too.

IT MUST be admitted at the outset that the subtitle above is a little misleading. Like the 1-ma. meter so many article writers seem to be able to find on a dusty shelf when their gadget needs one, it assumes that you can find at least one fair-size tree in your junk box. The ham with a wooded lot, where clear space for a horizontal at reasonable height and running in the right direction may be hard to find, will be the one most likely to take advantage of a contraption of this sort. Trees, when they are in the right spots, provide height at low cost. But horizontal antennas swung between trees at any appreciable height have a habit of coming down an hour after the contest starts. This vertical has a chance of staying put, even in rough weather.

The multiband part is an outgrowth of the parallel-dipole system which vies in popularity with the trap multiband dipole among those poor souls who still think in terms of simple antennas. The idea was first suggested in print by K5AYJ.[1] Quarter-wave radiators, one for each of the three bands (20, 15 and 10 in this case) are simply tied together at the base. The ground-plane radials are similarly cut and joined and the combination is fed with a single 50-ohm coax line.

Construction

The construction is shown in Fig. 1. The support for the three radiators is a 16-foot 2 × 2 of fir. The radiators are lengths of 300-ohm TV Twin-Lead (no special significance, of course, except that it is insulated and can be picked up at the corner TV store on a Saturday afternoon) with the two conductors connected in parallel. They are mounted on screw-type TV stand-off insulators. Use the longest size (7½ inches) so that those on the sides can be bent forward to occupy less space and avoid interference from branches. Since the 20-meter radiator is a little longer than the stick, the top insulator is screwed into the end of the 2 × 2 instead of the side. Mount the 20-meter radiator on the side of the 2 × 2 opposite to the side that will be against the tree trunk. The choice of sides for the other two radiators will depend on which gives the best clearance from branches. To make sure that the line doesn't slip in the insulators, pinch the retaining rings of the insulators with a pair of gas pliers after the line has been threaded through, and wind a wad of plastic tape over the top end of each radiator, just above the top insulator. The bottom ends of all radiator wires are soldered together and this joint, of course, goes to the center conductor of the coax line. Small porcelain stand-offs at the bottom of the 2 × 2 make convenient terminals for the coax connections.

The heart of the construction is the simple, but essential hook fastened about 3 feet from the top of the pole. This is snagged over a crotch in the tree and, among other things, permits getting the stick higher in the tree than it might be safe to climb. You have to climb only as far as the

* Assistant Technical Editor, *QST*.

[1] Swanson, "A Three-Band Ground-Plane Antenna," *QST*, February, 1958.

bottom end of the pole. Suspended by the hook, there is little more strain on the 2 × 2 than there might be on a candy cane hanging on a Christmas tree. This antenna has out-ridden some of the stiffest gales of the year, even though it is mounted in the uppermost part of the tree where movement is a matter of feet in a strong wind.

While looking around in the basement for a likely prospect to serve as a hook, I spotted an old plasterer's trowel — the kind that has a wood handle running parallel to a rectangular sheet-metal plate. Knocking off the wood handle left an almost ideal metal hook complete with a mounting plate that could be drilled for 1½-inch No. 10 round-head wood screws. These trowels can be found at almost any hardware store and cost about 50 cents. You may dig up something even better or handier.

Most trees have one side that is relatively free of branches. You can find the best side by sighting up along the trunk from the ground. While you're doing this try to spot a sharp crotch up near the top of the tree with a branch diameter of about an inch.

Mounting

The antenna assembly is not very heavy and it was not too difficult for one man, even on a windy day, to hoist the 2 × 2, by rope, to the top of a 25-foot ladder (in lieu of lower branches), and then slide it upward along the trunk of the tree until the hook fell into place in the crotch above. Keep the bottom of the stick out away from the trunk as far as you can, so that the stick will lean against the tree as it is being pushed up. The bottom end of the pole should have only a loose binding to the tree trunk so that it can have restricted movement in all directions.

Radials

Four-conductor poly-insulated TV-rotator control wire was used for the radials, of which there are four spaced approximately 90 degrees. The individual conductors of each radial were cut to lengths corresponding to the lengths of the radiators, two conductors in parallel being used for the 20-meter radials since these are the ones that take the strain. The excess wire left after cutting the shorter 15- and 10-meter radials was peeled off. At the antenna end, all radials are connected together and to the shield of the coax feed line.

On a wooded lot, there will usually be other trees that can be used as supports for the radials even though they may not be spaced ideally, and the house, garage or short poles can be pressed into service. It doesn't seem to be too important that the radials run horizontally. There was no difference that could be noticed when the radials were lifted from a temporary angle of about 45 degrees up to horizontal.

There will, of course, be some movement of the tree where the radials are anchored just below the antenna, and still more movement of the radials if other trees are used as supports. Extensions of awning cord were used at the ends the tree to the base of the antenna (in this case, about 30 feet above ground). A turn of the coax around a branch, secured by plastic tape, takes the strain off the connection to the antenna. Leave a little slack in the coax to allow for movement of the bottom of the pole.

The antenna had its baptism in the QRM of the October CD contest which started a couple of hours after the job was finished. With 250 watts input on c.w., it was seldom necessary to call a station more than once on any of the three bands. An unexpected bonus paid off when the two sides of the coax were tied together and the system worked against a waterpipe ground on 40 and 80. The length of the coax (about 50 ft.) was such that the feedpoint impedance was within the range of the pi network in the transmitter. (The system resembles an overgrown mobile antenna with the radials as a capacitive hat.) This arrangement also worked very well with 40-meter contacts with KH6 and KL7 and several West Coast contacts on 80. In the SS contest that followed, over 500 contacts in 72 sections were made with 150 watts input. DX worked within the past month with 250 watts includes BV1US, BV1USB, CR9AH, FF8AC/GN, FO8AW, HS1C, JAs 1AA, 1BC, 1KM, 1PS, 1VE, 2JW, 3SJ, 3TA, 3UI, 4HM, 4JQ, 6AP, 8AA, 8AH, 9AA, ØFZ; JT1YL, KA2CB, KA2KM, KC4USK, KG6NAA, KR6CA, KR6DY, KW6CU, KX6BP, OR4VN, SM5WN/LA/P, UL7FA, UL7KAA, UM8DB, UO5PK, UA9s AK, CC, DM, DR, OB, SB, VB, KCA, KCK, KMA, KQA; UA0s CF, CI, CN, FC, FE, JB, KJA, KOC, KSA, KUV; VK9AD, VS6AE, VS9AC, VU2AJ, ZD2GWS, ZD7SA, ZK2AD, ZP6FA and 4X4CJ on 20; DU7SV, ET2VB, JAs 1EC, 3BP, 5AI; KA2BE, KA2RB, KM6BL, KR6AK, OR4VN, SVØWP, UA6UF, VQ4CC, VS9AS, VS9AQ, and ZE5JE on 15; JAs 1BQR, 1EC, 1VX, 2YT, 3ALQ, 3BN, 3GM, 3IS, 7AD; KA8RA, KJ6BV, ZK1BS on 10; and couple dozen Europeans and 4X4KK on 40. Which goes to show that a lot can still be done with less than the optimum. QST

Strays

We almost lost another amateur last month. A Malibu ham attached one end of a long wire to a helium-filled balloon. On its way aloft it hit a 16,000-volt line. He was burned, but lived.

—···—

K6IRY reports that the Whittier 50 Club put its mobile members to work on Halloween evening. They assisted the police department in patrolling the city, in order to keep vandalism at a minimum.

—···—

We've had several letters about Teflon and its dangers (*QST*, Nov., p. 21), and hope for an early article. Perhaps the danger was exaggerated.

Simple Phone Monitor

Continuous Check for A.M. Stations

BY WILLIAM R. DEAL,* K1CLD

K1CLD finds that even in these days of oscilloscopes, the simple monitor that has been around for years can tell you a lot about your phone signals. Furthermore, you can hear the trouble and don't have to depend on an interpretation of a pattern.

SOME months ago, shortly after I had received my license and had got on the air, I had a most disquieting report about my signal. I was on 20 phone and the other chap said, "Sorry, Bill, missed some of that last transmission — funny noise kept coming and going — sounds like telephone dial tone — covers you right up." So I signed with him and tried to figure out what was wrong. The trouble didn't take long to find or to fix. It was a loose connection on the shield braid in the mike cable. But it made me realize that I should be able to monitor my signal at all times and not be guilty of putting any such racket on the air again.

Well, I had a scope gathering dust on the shelf. So I dug it out, made up a coupling circuit, and set it up so that I could check my modulation at any time while I was transmitting. I learned several things from this, to wit:

a) It did all the *Handbook* said it would in regard to checking modulation percentage.

b) It is not easy to watch it all the time.

c) It makes a wonderful impression on visitors to the shack.

d) It still didn't tell me what I sounded like.

I tried to use the station receiver as a monitor, but without much success. The receiver overloaded and was not convenient at best. Therefore I decided that some separate unit would have to be built.

The only phone monitor circuit I could find was in a tube manual, and it seemed unnecessarily complex (meaning parts not in my junk box). So, to make a long story short, I adapted a circuit that I found in a field-strength indicator in the 1956 *ARRL Antenna Book*. It is very simple, as the circuit of Fig. 1 shows. It uses no tuned cir-

* Piermont, New Hampshire.

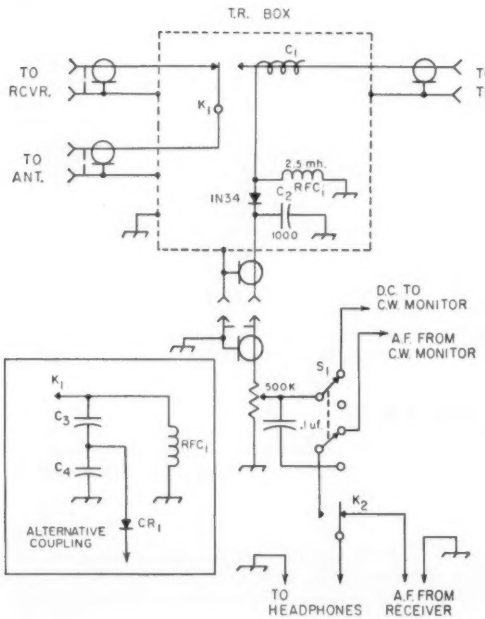


Fig. 1—Circuit of K1CLD's monitoring system.
C_1—See text.
C_2—Disk ceramic or feedthrough (see text).
C_3—10-$\mu\mu$f. mica (see text).
C_4—100-$\mu\mu$f. mica (see text).
CR_1—See text.
K_1—Antenna relay.
K_2—S.p.d.t. relay, coil to operate from same source as coil of K_1. Windings of K_1 and K_2 should be connected in parallel.
RFC_1—2.5-mh. r.f. choke.
S_1—D.p.d.t. toggle switch.

cuits and works very well with my 100 watts of r.f. on 10 through 160 meters. Also, by cutting out the 0.1-μf. blocking capacitor, the d.c. component may be used to power a transistor c.w. monitor, the volume control in this case becoming a tone control.

At K1CLD I use a home-built t.r. relay. This consists of a surplus relay mounted in a shield box. C_1, RFC_1, the 1N34 and C_2 are mounted in this box. The volume control and other components are placed near the operating position. There is nothing critical about anything in this circuit; you could even place the detector section in the transmitter cabinet. However, if you do this, be sure to bypass the output for TVI in the usual manner (a feed-through type capacitor for C_2 should do the job). Or, you could use a short pick-up antenna and not connect the monitor to the transmission line at all.[1]

The value of C_1 will depend on the power of the transmitter. Here, with 100 watts of r.f., C_1 consists of four turns of heavily insulated hookup wire wound around the "live" conductor in the t.r. switch, the capacitance being, I imagine, in the neighborhood of 5 $\mu\mu$f. Adjust its value for a d.c. output (measured with a v.t.v.m. across C_2) of about 10 volts. With this voltage (input frequency 14 Mc.), adequate audio volume is obtained on all bands (using high-impedance phones). As an alternative, the capacitive voltage divider circuit might be used. (See Fig. 1.) But in any case be sure that C_1 will withstand the maximum voltage appearing at the transmitter output. With the voltage divider, a crystal diode with a higher voltage rating than the 1N34 would probably be advisable.[2]

In operation, when you switch to "Transmit," relay K_2 operates simultaneously with the t.r. relay, removing the phones from the receiver output and connecting them to the monitor. Switching to "Receive" releases K_2 and restores the circuit to normal. The relay, K_2, is not really necessary; a toggle switch could be used, but would not be anywhere near as convenient.

It is obvious that it would be impractical to try to use a speaker with this monitor. There is not enough output to drive a speaker, and if there were, feedback would result. However, if you really must use a speaker — can't get on without it — you can still use phones connected to the monitor and listen now and then with one ear!

Once having installed this little unit I would feel quite lost without it. It tells me what my signal really sounds like — something the scope won't do — and if anything is wrong with my audio, I am the first to know it. I do not wish you to think that I am advocating this as a substitute for a scope for modulation checking — far from it — for it is not. It does, though, take over where the scope leaves off. It will reveal hum and distortion of too low a level to make a significant showing on the scope screen. Also, with my transmitter, I find it of help in tuning up as, in dipping the final, I notice that the audio quality is better when I tune very slightly to one side or the other of exact resonance.[3] And last, but not least, it enabled me to track down an elusive low-level bit of feedback I had on 10 meters!

I trust that anyone who duplicates this unit will find it as helpful as I have. QST

[1] Since diodes rectifying r.f. generate harmonics, this system may cause TVI through radiation from the pickup wire. — *Ed.*

[2] By proper adjustment of the voltage-divider capacitances C_3 and C_4, this should not be necessary. — *Ed.*

[3] This may be the result of regeneration in the final, or an adjustment that brings the screen voltage into the optimum region. — *Ed.*

Strays

Here are the January schedules for the various MARS technical nets.

First Army MARS

(Wednesday evenings 2100 EST, 4030 kc. upper sideband)

Jan. 7 — The Modern Approach to Front-End Receiver Design.
Jan. 14 — Trak — Morse Code to Teleprinter Converter.
Jan. 21 — Phone Patches.
Jan. 28 — Measurement of Nuclear and X-ray Radiation.

AF-MARS Eastern

(Sundays 1400 EST, 3295 and 7540 kc.)

Jan. 11 — Capacitors.
Jan. 18 — Radio in Antarctica.
Jan. 25 — Electronics and the Patent Law.

AF-MARS Western

(Sundays 1400 PST, 3295 kc., 7832.5 kc., 143.46 Mc.)

Jan. 4 — Kaiser-Aiken Thin Cathode-Ray Tube.
Jan. 11 — Kaiser Flitepath System.
Jan. 18 — Transmitters Powered by Solar Energy.
Jan. 25 — Design of Missile Support Equipment.

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On page 13 of the November issue we gave you some dope on great circle maps. Some of this information has to be changed. The Coast and Geodetic Survey now advises us that they have ceased to stock the ZD-10 maps, and that these must be ordered from the USAF Aeronautical Chart & Information Center, 2nd and Arsenal Streets, St. Louis, Mo. Coast and Geodetic Survey does continue to stock No. 3042.

To get the various U. S. Navy Hydro maps you will have to pass up the Government Printing Office and order from one of the local sales agents (too many to list here — check locally) or directly from the Navy Hydrographic Distribution Offices in Scotia, N. Y., or Clearfield, Utah.

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W2BTY has been appointed manager of GE's scatter and special systems engineering group.

Surplus-Crystal High-Frequency Filters

Selectivity at Low Cost

BY BENJAMIN H. VESTER,* W3TLN

Using the methods and circuits outlined here, the problem of making a usable high-frequency (i.e., in the 4- to 7-Mc. range) crystal filter doesn't sound too tough, even with limited test equipment. If you've been interested in some of the newer transmitting and receiving techniques using filters in this range, here's a way to give them a whirl without a large investment.

AFTER all the recent *QST* articles on uses for high-frequency crystal filters, I've really been coveting one for a mobile s.s.b. transceiver I'm planning. The commercial price tags on filters being what they are, I decided it would have to be built from surplus crystals, or not at all. Having, during the earlier days of s.s.b., suffered with a low-frequency crystal filter (typical report was, "Gee, your voice sounds funny"), I decided to do a little reading before dragging out the soldering iron this time.

A recent article by Kosowsky [1] boils a lot of "long-hair" literature on crystal-lattice theory into a fairly simple and understandable form. One of the most interesting points to me was the fact that the crystal filter designer considers the narrow-band high-frequency crystal filter for s.s.b. to be the "easy" design — the problem getting much more exotic for the wide-band high-frequency filter. Since my buddy, W3HEC, was already tackling the tough problem of making a good low-frequency filter with the FT-241 crystals, I took the easy way out and tried my hand with the high-frequency unit.

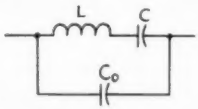


Fig. 1—The equivalent circuit of a crystal. *L* and *C* are the electrical equivalents of mechanical constants of the crystal, while C_0 is the shunting capacitance of the electrodes and holder.

Some Background

If you're planning to try your hand at it, it will help if you grab a few fundamental concepts

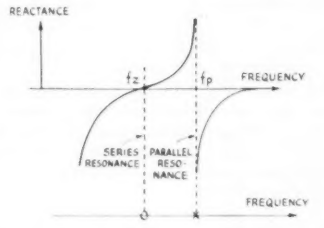


Fig. 2

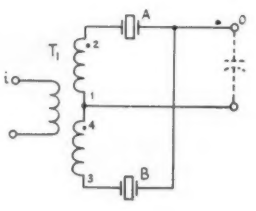


Fig. 3

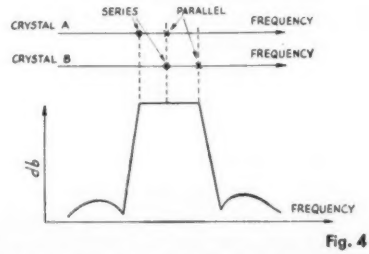


Fig. 4

* 601 Wallerson Road, Baltimore 28, Md.

[1] Kosowsky, "High Frequency Crystal Filter Design Techniques and Applications," *Proceedings of the IRE*, Feb., 1958.

Fig. 2—Reactance characteristics of a crystal. The series-resonant frequency, f_z, is that of *L* and *C* (Fig. 1) in series; the parallel-resonant frequency, f_p, is the resonant frequency of the parallel circuit formed by *L* and *C* in one branch and C_0 in the other.

Fig. 3—The half-lattice crystal filter. Crystals A and B should be chosen so that the parallel-resonant frequency of one is the same as the series-resonant frequency of the other. Very tight coupling between the two halves of the secondary of T_1 is required for optimum results.

Fig. 4—The theoretical attenuation-*vs.*-frequency curve of a half-lattice filter shows a flat pass band between the lower series-resonant frequency and higher parallel-resonant frequency of the pair of crystals.

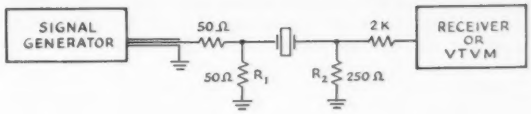


Fig. 5—Setup for measuring the series- and parallel-resonant frequencies (or pole-zero spacing) of a crystal.

on crystal lattice filters first. The properties of the crystal itself are pretty well known, the approximate equivalent circuit being shown in Fig. 1 and the change of reactance or impedance being shown in Fig. 2. The crystal has two resonances very close together, L and C being in series resonance at f_s, and L, C and C_o being parallel resonant at f_p. These resonances have been given names by the network theory boys, the series resonance being called a "zero" of impedance (for obvious reasons) and the parallel resonance being called a "pole" of impedance. The symbols used for these are shown on Fig. 2. These poles and zeroes are mighty convenient little symbols for handling networks, the most convenient part being the fact that if you have a circuit with several poles and zeroes, you can often manipulate the circuit values so as to get some of the zeroes each to cancel out a pole. Hence, a circuit with a multitude of resonances (or poles and zeroes) can be arranged to have its response equivalent to only a few resonances.

The universal crystal filter is a lattice circuit. The lattice is usually developed in full "four-arm" form (i.e., as a bridge circuit) and then the equivalence of the half-lattice is proved. The reader is referred to Kosowsky's article and its bibliography for the full treatment on this. We will settle for a few statements on crystal lattice filters which have been adequately proven by others. Consider the simple one-section half lattice shown in Fig. 3. The first important point to consider is that the only way in which the lattice can give a high insertion loss between input and output is for the impedances of A and B to be about equal, so that the voltage at their common connection (point O) is equal to the voltage at the coil center tap. Our crystals will meet this requirement pretty well if they have the same holder capacitance, so the primary problem is to build the coil so that the voltage from Terminals 1 to 2 is exactly the same as the voltage from 3 and 4. The method for realizing this will be discussed a little later.

Crystals A and B are chosen to be different in frequency for the half lattice. Thus it is obvious that if we are at a zero (series resonant) frequency of, say, crystal A, the impedance balance of A and B is spoiled and there is a voltage showing up between point O and the center of the coil. This will also occur at the pole (parallel resonant) frequency of crystal A. The same can be said for crystal B, only the unbalance is in the opposite direction. This leads us directly into the statement that the pass band of the crystal filter will be as wide as the spacing of all the poles and zeroes. This says nothing about the ripple or variation in transmission in the pass band, however, and if A and B are far apart the ripple or dip may be tremendous. Here's where the network theory boys' trick of pairing off poles and zeroes comes in handy. A little study with Fig. 2 of the way in which the impedance change around a zero differs from that around a pole will give an idea how the lattice crystals can be arranged to give a flat pass band. Fig. 4 shows the desired arrangement. The series-resonant frequency of crystal B is arranged to coincide with the parallel-resonant frequency of crystal A. This will theoretically give a perfectly flat pass band from the zero of crystal A to the pole of crystal B.

Our problem is now resolved down to determining the pole-zero spacing for the available crystals. The surplus FT-243 crystals in the 5-Mc. range (this choice of frequency was obviously based on the excellent results being obtained with the popular HT-32 transmitter) have a measured spacing of about 2.2 kc. between their series- and parallel-resonant frequencies. Thus, two of them spaced 2.2 kc. apart in frequency are theoretically capable of giving a 4.4-kc. bandwidth. Practically, it is very difficult to get quite this much bandwidth.

If we examine the effects that the external coupling circuitry has on the pole-zero spacing, it can be shown that both an increase and a decrease in the spacing can be accomplished, by shunting inductance or capacitance, respectively, across the crystal. The most familiar example of this to most of us is in pulling a crystal oscillator's frequency by shunting a capacitor across the crystal. This technique, you will remember, only works where the crystal is being used in its parallel-resonant mode. Referring back to Fig. 1, it is easily seen that a parallel capacitor makes C_o larger and lowers the parallel-resonant frequency (pole). It will not affect the series-resonant frequency (zero), so the effect of the parallel capacitor is to move the pole closer to the zero. Similarly, it can be shown that an inductance shunted around the crystal will push the pole away from the zero; unfortunately, however, this also introduces a second parallel-resonant frequency. Even the network theory boys begin to sweat a little when they begin to manipulate this many poles and zeroes in a lattice circuit, so we hams had better avoid the complications, and shy away from trying to add tuned inductors on the input and output of the filter. If we are forced to use an inductor, we will make its inductance large enough to avoid its resonating with C_o anywhere near the desired pass band.

Preliminary Measurements

Now that we have some ideas as to how crystal

filters work, we will get more specific and look at the procedure by which one may be evolved. To measure the spacing between the series- and parallel-resonant frequencies, we must be careful to avoid having the test circuit put shunt capacitance across the crystal and give erroneous results. The circuit in Fig. 5 was used by the writer. To eliminate the extra shunt capacitance that a socket would add, the crystal holders were soldered directly into the circuit. The signal generator can be most any kind, so long as it has a slow tuning rate — I used one of the Command transmitters. The measurement detector can be a scope, a v.t.v.m. (with r.f. probe), or the station receiver. The low resistance R_2, across it should swamp out any small amount of input capacitance it might have. If a receiver is used, a 1K or 2K resistor should probably be put in series with its input to isolate the crystal from the receiver front-end tuned circuits. The series- and parallel-resonant frequencies are, of course, at the peak and null of the signal across R_2. Any decent communications receiver will measure the frequency difference; best accuracy is obtained by measuring the harmonics of the generator with the receiver in the sharp crystal-filter position.[2]

Initial measurements of the two 5645-kc. crystals I had showed a pole-to-zero spacing of 2.2 kc. on one and 2.4 kc. on the other. Their series-resonant frequencies were about 560 cycles apart. I decided to try these out first to get a bearing on the problem.

As indicated earlier, the push-pull coil must have very tight coupling between its two secondaries and should be chosen with a high enough inductance to avoid resonance with the crystal shunt capacitance near the pass band. I used a ¾-inch ferrite toroid (origin and properties unknown) with the secondaries wound bifilar. The bifilar winding is illustrated in Fig. 6. The en-

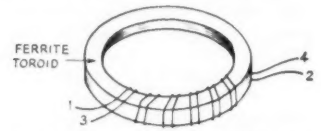


Fig. 6—Bifilar winding on a toroidal core.

closed LS series coils made by CTC probably would work just as well. (It would probably be very difficult to get tight enough coupling with air-wound coils, however.) I arbitrarily made each half of the secondary coil with an inductance of 50 microhenrys; this required 25 bifilar turns, or 50 turns total. The exact inductance is not at all crucial — the important thing is the tight coupling.

[2] I.e., after adjusting the generator to the series-resonant frequency, let the generator alone and shift the receiver to some higher range where a generator harmonic can be heard and its frequency measured. Then shift back to the fundamental frequency, adjust the generator to the parallel-resonant frequency, shift the receiver again and then measure the generator harmonic adjacent to the first one. The frequency separation between the crystals is of course equal to the frequency difference between the harmonics divided by the order of the harmonic. This method usually will give improved accuracy only if the receiver calibration can be read to the same accuracy — e.g., 1 kc. per dial division — on the harmonic range as on the fundamental. — *Editor.*

Experimental Results

A filter was constructed with the circuit shown in Fig. 3. It was fed from a low impedance and its output was fed into a 6AK5 mixer grid, the mixer grid effectively shunting some capacitance across the crystals. This mixer was used to beat the filter output signal into a range which was covered by my receiver (a 75A-3) so the receiver could be used for both db. and frequency measurements. The initial response was as shown by curve "A" in Fig. 7. A 10K resistor was then added to terminate the filter and the response squared up (as shown by curve "B") to give a passable 1-kc. high-frequency filter.

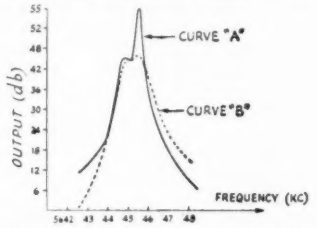


Fig. 7—Measured attenuation curves of a half-lattice filter using two nominal 5645-kc. crystals having series-resonant frequencies separated by 560 cycles. A—without resistance termination; B—with 10,000-ohm terminating resistor. In taking the data for these curves and those shown in Figs. 8, 9 and 11, the attenuation was based on the manufacturer's calibration of the receiver used in the tests.

This was sufficiently encouraging, so I dug out the ammonium bifluoride[3] etching bath from its hiding place, and moved the upper-frequency crystal to a frequency 1500 cycles above the lower frequency (W2IHW's technique for etching crystals is really simple).

The initial results with this were anything but encouraging. Curve "C" in Fig. 8 illustrates the results. It was obvious that the capacitance across the lattice output had shoved the poles too close to the zeroes, or else the 0.5-meg. terminating resistor was improper. I tried tuning the capacitance out with a slug-tuned coil and got all kinds

[3] Newland, "A Safe Method for Etching Crystals," *QST*, Jan., 1958.

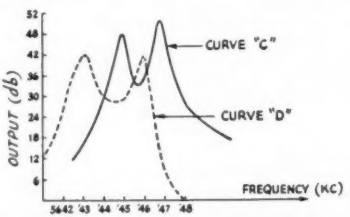


Fig. 8—Attenuation curves of half-lattice filter with crystals of the same nominal frequency as in Fig. 7, but with 1.5-kc. separation. C—with 0.5-megohm terminating resistor; D—shunt coil added across the output to resonate with capacitance present at that point.

of interesting results (curve "D" in Fig. 8 is typical), none of them usable. When I terminated the filter with lower values of resistance, however, the results improved markedly. With just the right resistor, 1.5K in this case, the pass band was flat over a reasonable width. Curve "E" in Fig. 9 shows the final results. The bandwidth is just barely great enough for phone use.

Since I had one other 5645-kc. crystal which was 300 cycles from one of the original crystals, I substituted it in and got curve "F" in Fig. 9. This time a 3.9K terminating resistor gave the flattest pass band.

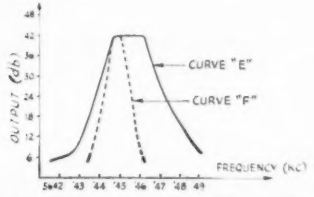
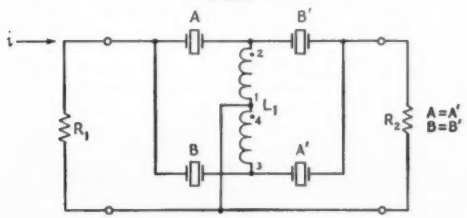


Fig. 9—E—half-lattice filter using same crystals as in Fig. 8, with 1500-ohm terminating resistor. F—using two nominal 5645-kc. crystals separated 300 cycles, with 3900-ohm terminating resistor.

If greater rejection off the skirts is required, there are several ways in which these sections can be cascaded. Crystals of the same frequency can be paralleled on the half-lattice arms, or an isolating tube can be placed between two sections. A simpler technique is to connect them back to back as shown in Fig. 10. This method of connection will minimize spurious off-frequency responses since the probability of getting the spurious responses of crystals A and B to line up with those of crystals A' and B' is pretty small. The coil, L_1, is again wound bifilar and R_1 and R_2 are chosen experimentally for the best pass band. The crystals should be matched as closely as you can read their frequency — this is pretty easy with the etching technique. Fig. 11 shows the response I got from four 7300-kc. crystals, connected like Fig. 10 (crystals A and A' were 1.5 kc. higher than B and B'). The same bifilar coil was used. Incidentally, I got a peep inside one of the 9-Mc. commercial s.s.b. filters recently and they used this circuit. Their filter used an LS-9 coil (C.T.C. Corp.) for L_1.

I measured the spacing between series and

Fig. 10—Half-lattice filters cascaded in a back-to-back arrangement. The theoretical curve of such a filter has increased skirt selectivity and fewer spurious responses, as compared with a simple half lattice, but the same pass band as the simple circuit.



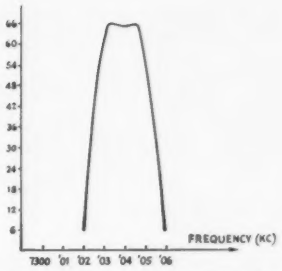


Fig. 11—Attenuation curve of filter using four nominal 7300-kc. crystals, pairs separated 1.5 kc., in the circuit of Fig. 10.

parallel resonance of a few of the other surplus crystals that were lying around and got the following results:

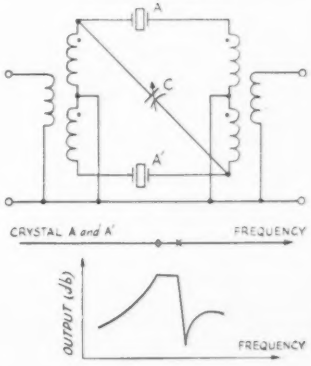
Crystal Frequency	*Type*	*Pole-Zero Spacing*
8725 kc.	FT-243	2.7 kc.
7250 kc.	FT-243	2.3 kc.
7380 kc.	Plated-surplus	5 kc.
7010 kc.	Plated-surplus	6 kc.
8900 kc.	Plated-harmonic cut	20 kc.

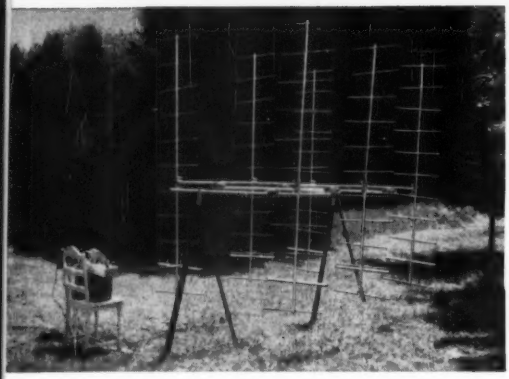
Obviously, the plated crystals will give wider-band filters.

If you're interested in an asymmetrical filter which has a gradual fall-off on one side, then the circuit shown in Fig. 12 can be used. Here both the crystals are on exactly the same frequency. The coils are again bifilar and C is tuned to give the desired pass band. The potential bandwith here is only half that obtained with the half-lattice. It should work nicely with the plated crystals, however.

I hope this will encourage some of you fellows to try your hand at building filters. I only have a handful of crystals and have only spent a couple of weeks playing with them, so I haven't had an opportunity to try all the circuits. By the way, if any of you find out what's in the HT-32 crystal filters, drop me a line. QST

Fig. 12—An asymmetrical filter and theoretical attenuation curve.





The array was mounted at ground level to carry out the matching adjustments, with transmitter and s.w.r. bridge at the left.

High Gain and Easy Matching in a 6-Bay Yagi Antenna System

BY EDWARD P. TILTON,* W1HDQ

A 66-Element Stacked-Yagi Array for 220 Mc.

For some months we'd been planning to go in heavily for 220-Mc. work at W1HDQ. This meant something new and bigger in the way of a 220-Mc. beam than the 16-element job that had served well in the past. The new array was to go on a crank-up tower recently installed, so it was imperative that it be relatively light and strong, in addition to being able to provide outstanding performance.

We've been in the middle of the Yagi-collinear controversy for many years. It is not expected that this new array will settle the argument, but we decided to give the stacked-Yagi type of beam a good workout. Though no new principles are involved, builders of v.h.f. arrays may find some of the construction and matching ideas of interest.

Phasing and Matching

Six 11-element Yagi bays are employed, three beside three, with 1-wavelength spacing each way. The phasing lines are open-wire TV line, ½-inch spaced No. 18, though any reasonable line spacing and impedance can be used. Because of the 1-wavelength spacing, no line transposition is made at any point between bays. This helps to prevent line shorting troubles. The phasing between the two halves of the array is done with two 1-wavelength lines, which meet at the top of a matching stub mounted on the center support as shown schematically in Fig. 1.

A distinct advantage of this method is that the actual impedances of the individual bays and the phasing lines need not be known. With feed impedance being difficult to figure even in a single Yagi, and all but impossible in a stacked system, this is no small consideration. There is an appreciable s.w.r. on the phasing system, but this is of no practical importance because the lines are short and of low-loss construction.

* V.H.F. Editor, *QST*.

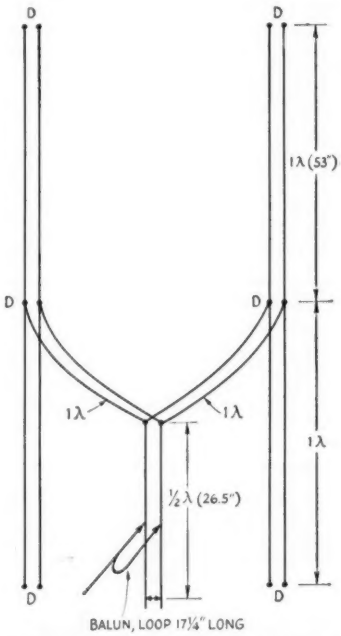
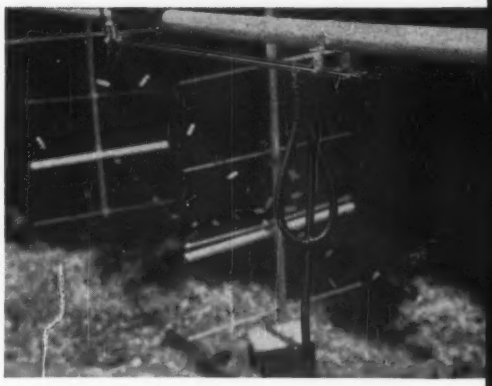


Fig. 1—Phasing and matching system used in the 66-element 220-Mc. array. Bays are one wavelength apart, so no transposition of the open-wire phasing lines is needed. Two one-wavelength lines join at the top of a closed half-wave stub. The main feedline is connected to this stub at the point of minimum s.w.r. Transmission line may be balanced open-wire or Twin-Lead, or a balun and coax, as shown.



A close-up of the phasing and matching system that is diagrammed in Fig. 1. The coax is thoroughly taped, both to hold it in position and to make the ends weatherproof.

The array may be fed with any kind of transmission line, merely by tapping the line onto the matching stub at the point of minimum reflected power. We used 52-ohm coax and a balun, but 75-ohm coax and a balun, or any impedance open-wire or Twin-Lead line could be used similarly. The installation at W1HDQ requires a run of 125 feet of transmission line. The loss in inexpensive coaxial line would be prohibitive at this frequency, so coax was used only for the rotating portion of the line, at the top of the tower. Just enough coax is left loose to permit rotation. This is terminated in a balun and taped to the tower. From the balun, whose impedance at the open end is 200-ohms, we go into a Q section of ¼-inch copper tubing, and then into 400-ohm open-wire line. Principal details of the Q-section assembly are shown in Fig. 2.

The Yagis

The individual bays are 11-element Yagis of standard design. These are available from CushCraft, Manchester, N. H., or the builder can make his own by following Table 18-1 in any recent ARRL *Handbook* or 10-1 in the *Antenna Book*. Spacing of all elements is 0.2 wavelength. Elements can be ⅛- to ¼-inch diameter, tubing or rod stock.

The driven element of each Yagi is a folded dipole. In the CushCraft Yagis the large conductor is 1-inch tubing and the fed portion of the dipole is ¼ inch. Sizes are not critical in this application, however, for the actual impedance of the bays is not important. Use of something approximating a 4:1 conductor ratio is desirable, as it will keep the s.w.r. on the phasing lines to a moderate value.

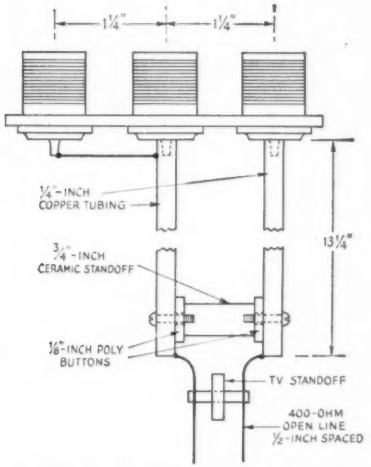


Fig. 2—Construction details of the quarter-wave Q section used between the balun and 400-ohm open-wire transmission line. If coax is used for the entire transmission line run, the balun and Q section are omitted.

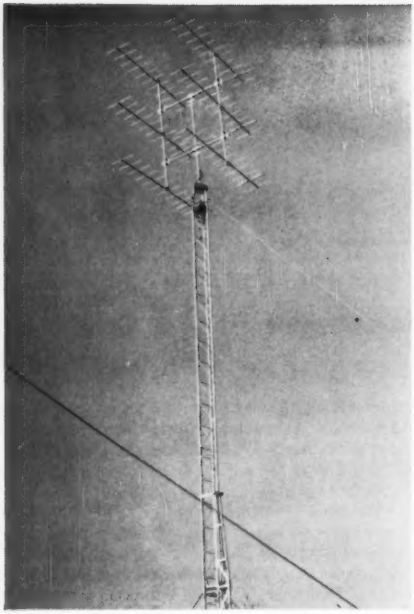
No precise dimensions are given for the spacing between bays, as this is not critical as to performance. The phasing lines should be cut to the proper length and the array assembled on its supporting frame. The individual bays may then be tightened in place at the spots where the phasing lines are pulled up without appreciable slack. They should not be stretched tight, as this will tend to pull the back parts of the array closer together than the fronts, destroying the alignment of the booms.

If the CushCraft Yagis are used a slight modification must be made to the driven elements of the two center bays. The top bays are mounted with the fed portions of the driven elements facing down. The corresponding bottom bays face upward. The driven elements of middle bays have to be rotated 90 degrees, in order that the physical spacing between the upper and lower halves of the array can remain the same. This is done with the CushCraft Yagis by merely drilling a hole through the driven element perpendicular to the one made by the manufacturer for mounting the element, and then turning the element around so that the fed and large portions of the dipole are in the same horizontal plane.

Assembling the Array

With towers that will not tilt over, it may be desirable to put the array together up at the top of the tower. Ours is on a new Rohn Model 25 tilt-over tower, so we cranked it up assembled. But crank-up or climb-up, you'll still want to assemble the beam on the ground to try everything for size.

The supporting frame was made of aircraft aluminum tubing (Channel Master No. 9215) 1¼-inch o.d. This comes in 7½-foot telescoping sections, and is very light and strong. Four sections were required, two for each side. They were assembled and then pinned together with self-tapping screws. The three Yagi bays were



This is how it looks in the air, without birds. We'll let you know next spring how it stood up under New England wind and ice.

then fastened in place, setting their spacing so that the phasing lines just reach their respective terminals, as mentioned earlier. The extra masting is then sawed off. The excess material is just about enough to make the two horizontal members of the array. The actual spacing between the element ends is not critical. About ½ wavelength is all that can be had without using more than four of the mast sections.

The vertical support is high-carbon steel tubing (Channel Master No. 1610B) of the same size as the aluminum tubing, but 10 feet long. The number of these to be used will depend on the mounting method employed. Rotator and drive shaft installations vary so widely that there is probably no point in describing the system used in this case.

The matching stub is fastened to the vertical support by means of clamps made of strips of aluminum, the stub itself being mounted on 1-inch ceramic standoffs. The actual dimensions of the stub are unimportant, so long as it is at least a half wave length long. Ours is ¼-inch copper tubing, spaced about 1¼ inch center to center.

Matching Adjustments

The array was put together on the ground, just to see how everything went together. The new tower had not arrived when the assembling was done, so we propped the array up, booms pointing straight up, on some temporary supports driven into the ground. Originally we had intended this to be merely a means of "storing" the array until the tower work was completed, but looking at it in this position we had a happy thought — why not make the matching adjustments right now?

The reflectors were about a half wavelength above ground. We reasoned that if the element lengths were anywhere near right there would be little energy going down. There was nothing but sky above the array, where the energy should be going. Thus, the beam should work in essentially the same manner as when mounted at the top of the tower. No harm in trying, anyway. The matching could always be done over by climbing the tower, or by tilting it over.

Accordingly, a 40-watt transmitter for 220 Mc. (soon to be in *QST*) was set up out in the dooryard, where it could be switched on and off easily when adjustments were being made. An s.w.r. bridge was connected between the transmitter and the short length of coax that was to comprise the rotating section of the line. From then on it was merely a matter of sliding the adjustable short and the taps for the balun along the stub until positions were found for both that resulted in zero reflected power. This was completed in a very few minutes.

A word about the taps on the stub may be in order. These were made with spring grid clips of the type used for metal tubes (National Type 8). The adjustable short was made of two of these, the rest of the short consisting of a suitable length of ¼-inch copper tubing soldered over the hinged ends of the clips. The coaxial balun was terminated in two more of these spring slips. The copper tubing comprising the line was polished clean and bright with steel wool, to be sure of a good contact. This is important, as the r.f. current is very high, especially at the short.

The short will be a half wavelength from the open end, where the phasing lines are soldered on, unless the array introduces some reactance. The array won't be reactive if it is made according to the dimensions given, and the elements are cut to *Handbook* specifications, for the middle of the frequency range you expect to use most. (If you are going to be a low-ender, make your adjustments at 220.5 Mc. or so, and you'll retain close to optimum performance over at least the first megacycle. We used a crystal at 220.7, and can see no practical difference in performance at 220.03. Our short is 26½ inches from the open end. The optimum point of connection for the balun was 4 inches up from the short.

Remember that the stub and balun tap positions react on one another. Check each several times to be sure that it is at the best spot. Using about 10 watts output (forward power indication on a Micromatch) we could get the reflected power down to where no movement of the meter could be seen when the transmitter was switched on and off. Movement of either adjustment by ⅛ inch in either direction produced discernible reflected power readings. The short and the balun taps were soldered permanently in place when adjustments were completed.

The effectiveness of this aiming-at-the-sky method was checked by moving a sheet of metal screening around under the reflectors. No change in reflected-power reading could be seen, but moving near any of the directors with a hand or a metallic object caused the reflected power to rise quickly enough. We figured this meant that our matching would still be good when the array was 60 feet above ground, and so it turned out.

The construction of the balun at the Q-section end of the coax gave us an opportunity to do something we've wanted to try for years; namely, measure the loss in a long run of open-wire line. We've seen the figures that show open-wire line to be far superior to any inexpensive coax in this respect, but there was always the haunting feeling that perhaps that open-wire line had a lot more radiation loss than it was credited with.

Now we could find out. The transmitter (the 40-watt exciter already mentioned, driving the 4X250B amplifier described by W1VLH in *QST* for February, 1957) was set up so that it was putting 70 watts into the antenna coupler at the station end of our 125 feet of line. Then another micromatch was taken up the tower and connected between the balun and the coax, and the two readings compared. At the top the power indicated was 30 watts, a loss of 40 watts, or just over 3 db. For nearly 125 feet of open-wire line plus the antenna coupler this is probably not too bad, but it also indicated that expensive low-loss coax just may be worth its price.

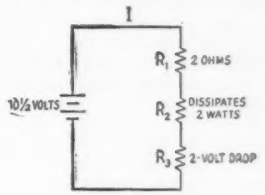
The fold-over tower imposes some special feed-line problems. We brought the line down inside the tower all the way. It is supported about every four feet on TV standoffs. At the hinge point in the tower the line is looped toward the middle of the tower and back, to give enough slack to permit the tower to be folded down.

How much gain? Everyone wants to know, and so do we — but the more we work with antennas the more we tend to look askance at gain figures taken by amateur methods. Use of an array over a considerable period will tell you more than any other test as to whether the antenna is working as it should. This one has been in service about a month as we write. It shows well over 20 db. front-to-back ratio. As to be expected with large stacked arrays, there are sizable minor lobes either side of the main one, but all three lobes are sharp. Nulls are very deep, and there is not much all the rest of the way around until the bulge shows off the rear.

The array has been used several times in high winds and heavy rains, and it shows little fluctuation in performance under these conditions. Reception off the sides is farther down than any array we've used on any frequency. This isn't always an operating advantage, on a sparsely-populated band — but we know of no other way to get gain than to take something off the sides and back, and put it out front where it will do the most good. From the rotation patterns we've run, and from the reports we're getting over surprising distances on 220 Mc., this 66-element bird roost is doing well in this department. QST

Quist Quiz

As Martin Sonn, K1CKZ, puts it, "Here's a stinker for your Quist Quiz." His problem is to find R_2, R_3 and the current I in the circuit below.



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The v.h.f. man last month belonged to the if-you-can't-lick-'em-join-'em school. He built a box that measured 1 yard on a side; there was more than enough room for the antenna across a diagonal.

—···—

You can stop trying to work out that 10th-order delta of ten 10-ohm resistors mentioned in November. It should have read "the 10th-order delta would use *forty-five* 10-ohm resistors." Credit W5RSJ with first calling attention to our mistake, not W3WZL's. (That printer has got to go!) QST

Strays

Some of our *QST* authors mention (not complain, mind you!) that they get some pretty silly questions about their articles. Our authors have no objection to helping out anyone who is in real trouble, but they all hope that those who have questions will first read the articles carefully and then check to see if the answers to their questions aren't in the *Handbook*. Answering the mail can be somewhat of a problem at times.

—···—

Besides having amateur radio as a common interest, all members of the B&O Radio Amateur Club are employees of the Baltimore and Ohio system. At last report the club had sixteen members, and the club had a nice write-up in the November issue of the *Baltimore & Ohio Magazine*.

—···—

K6MDD says he knows there are a lot of clowns in ham radio, but he claims to be the only one who works at it. He is known professionally as Gum-Bo the Clown, and he'd like to hear from any other clowns who are also hams, or vice versa.

• Recent Equipment—

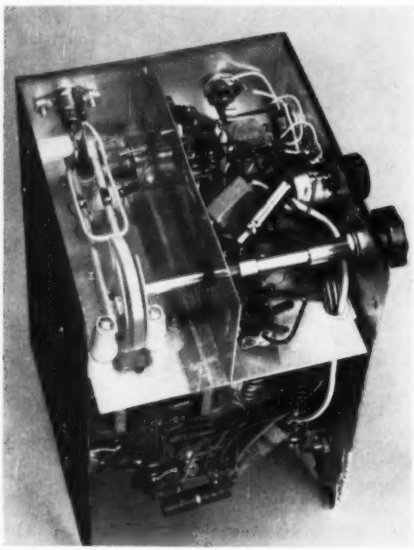
The Vocaline AT-30 420-Mc. Transceiver

When the Vocaline Company, Old Saybrook, Conn., brought out a small transceiver for the Citizens Band some years ago, quite a few hams thought that a similar unit modified for use in the amateur 420-Mc. band would be a useful item. The necessary modifications for tunable coverage have now been made, and the AT-30 is the result.

This is a transceiver in its simplest sense. A single tube is used for both transmitter oscillator and superregenerative detector, but separate audio stages are used for receiving and transmitting circuits. The transceiver has its own built-in power supply of the universal type, for operation from either a car battery or a.c. source. Models are available for 6- and 12-volt battery systems. A quarter-wave whip antenna (6 inches long) is supplied, but this can be removed and more effective antenna systems plugged in for extending the operating range. A microphone equipped with push-to-talk control is included.

Perhaps it is well to understand what the AT-30 is *not*, also. It is not a home-station type of equipment for general communication on 420 Mc. It is intended for short-range work over unobstructed paths, usually in conjunction with another similar station. The owner should not expect to cover distances that are routine with more sensitive and powerful self-contained stations for 144 or 50 Mc. The superregenerative detector is loosely coupled to the antenna for uncritical tuning and minimum radiation in the receive position, so it is not markedly sensitive. The power output is necessarily low. This adds up to useful coverage over clear paths, but the signal does not bend over hills or beyond the horizon to any usable extent.

The Vocaline 420-Mc. transceiver is supplied complete with push-to-talk microphone, power supply and antenna.



Interior view of the Vocaline AT-30 transceiver, showing dielectric-tuned tank circuit, left. Phone jack and antenna socket are mounted on the top surface of the case. Power cables plug into the front panel, lower right.

Operation of the AT-30 is simplicity itself. Frequency of transmission and reception is set by a roughly-calibrated knob on the front panel. The only operating controls are the push-to-talk switch on the microphone and the volume control. The detector makes the characteristic rushing sound, which will bring on a case of nostalgia to any avid v.h.f. man whose experience dates back to the '30s. It will be listened to with less favor by people not trained to enjoy the soothing sound of a superregen in full hiss, and the manufacturer tells us that he is still looking for a good (but *simple*) squelch circuit for the SR detector.

Design-wise, the principal item of interest is the tuned circuit used in the 6AF4 oscillator-detector, details of which are visible at the left side of the interior photograph. This is a silver-plated half-wave line, tuned by means of a semicircle of sheet polystyrene. This turns between two half moons of silver-plated brass, changing the capacitance by varying the dielectric constant of the space therein. It is not a new idea, by any means, but the way it is worked out here could be used handily in many u.h.f. receiver and low-power transmitter circuits. It is devoid of noisy metal-to-metal contact problems.

We can think of dozens of uses for two of these compact lightweight stations, and we feel reasonably sure that they will become popular with the amateur fraternity, and especially with holders

of Technician Class tickets. They could be applied to many jobs, not a few of which might well have considerable public-relations value. Users should bear in mind that this is a transceiver, with a radiating detector. It should not be used for listening in on serious work that may be going on in the 420-Mc. band in the owner's vicinity. Confining operation to below 432 and above 436 Mc. is also strongly recommended, in areas where the middle four megacycles of the band are in use by stations employing stabilized equipment.

— *E. P. T.*

The Babb Electronics TRA-6 Transmitter Converter

HERE is a package for the mobile enthusiast, or the fixed-station operator who wants to operate on 50 Mc. with about the most compact station possible. The Model TRA-6 by Babb Electronics * is a transmitter for 50 Mc. with a compact converter built into the same box. It requires only a small power supply and a communications receiver to make it a complete station. In a pinch, the receiver power supply might even take care of the TRA-6 power drain.

The converter in the TRA-6 is an International Crystal Mfg. Co. Type FCV-2, supplied with either 7-Mc. or broadcast-band output. Other intermediate frequencies may be had on request. The transmitter uses a 6U8 oscillator-doubler and a 5763 amplifier, running up to about 10 watts input. The modulator is a 6AQ5 and a 6AU6, with adequate gain for a crystal or high-impedance dynamic microphone.

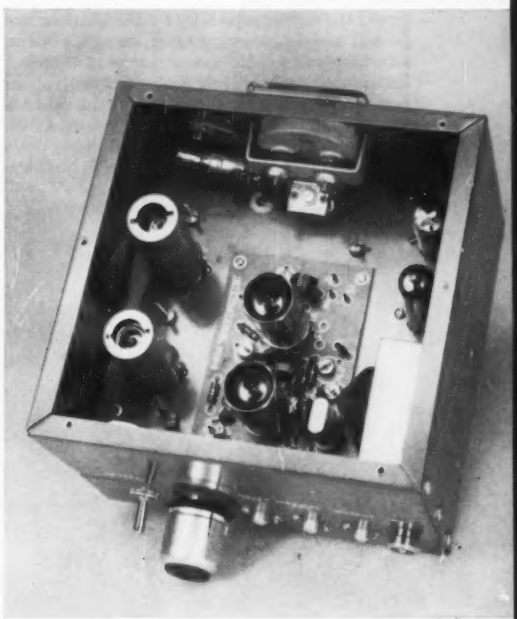
All circuits in the TRA-6 are of elementary simplicity, so adjustment is simple and operation should be all but foolproof. If the communications receiver is to be used on other bands, in addition to serving as an i.f. for the TRA-6 converter, a socket on the back of the unit is provided for the antenna system used for the other bands, in addition to one for the 50-Mc. antenna. Choice of two crystal frequencies is available by means of a toggle switch. Crystals in the 25-Mc. range are used. The power required is 6 or 12 volts, a.c. or d.c., and 150 to 250 volts d.c. at 65 to 90 ma., depending on the voltage.

Versatility of operation is provided by the control circuits, the main control switch having five positions. These are marked OFF, EXT, REC, SEND and NORM. In the first position everything is turned off. On EXT, the heaters are energized, but no plate power is applied to transmitter or receiver. In this position external controls may be used, for push-to-talk, remote operation and the like.

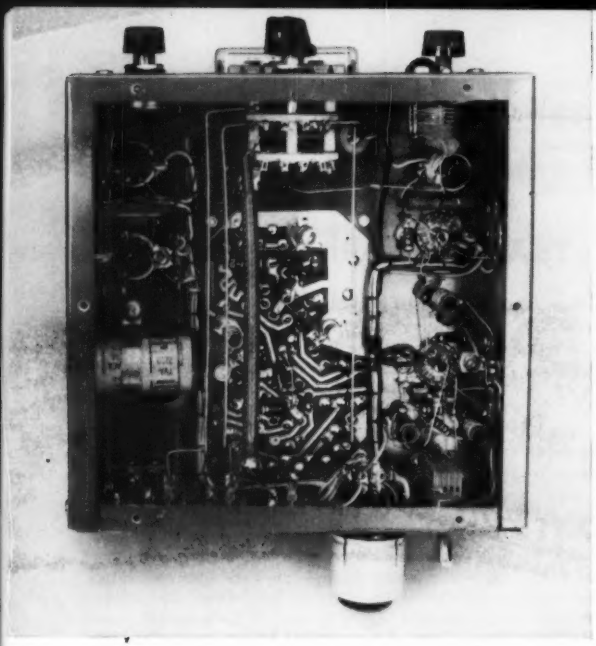
In the REC position the setup receives on 50 Mc. On SEND the 50-Mc. transmitter comes on. The NORM position runs the heaters of the TRA-6, but with no plate power on either transmitter or converter. An antenna other than the

* J. Wilbur Babb Electronics, 202 W. Seminole, McAlester, Oklahoma.

Interior of the TRA-6, showing the back of the case. Crystal switching is provided by the toggle switch at the left.



The Babb Electronics TRA-6, a 10-watt 50-Mc. transmitter with built-in crystal-controlled converter and control circuits.



Bottom view of the Babb transmitter-converter. Printed circuit portion is the built-in International FCV-2 converter.

one for 50 Mc., connected to the jack provided on the back of the unit, is switched to the communications receiver terminals. This is convenient for crossband operation, a mode frequently employed by 50-Mc. operators.

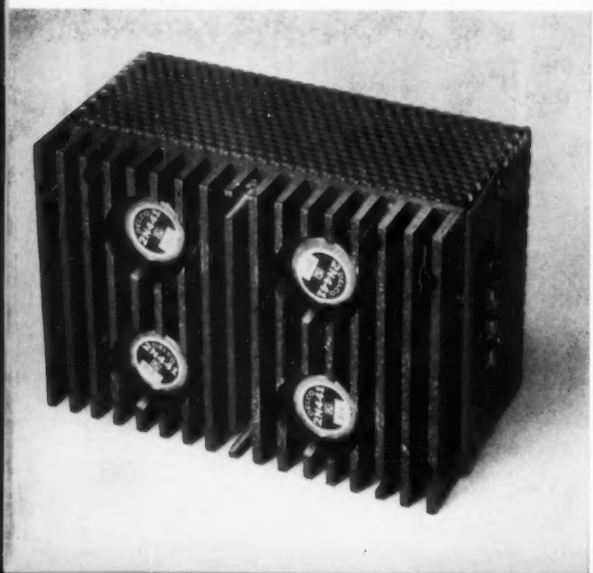
— *E. P. T.*

The F. W. Sickles Model 17712 Power Converter

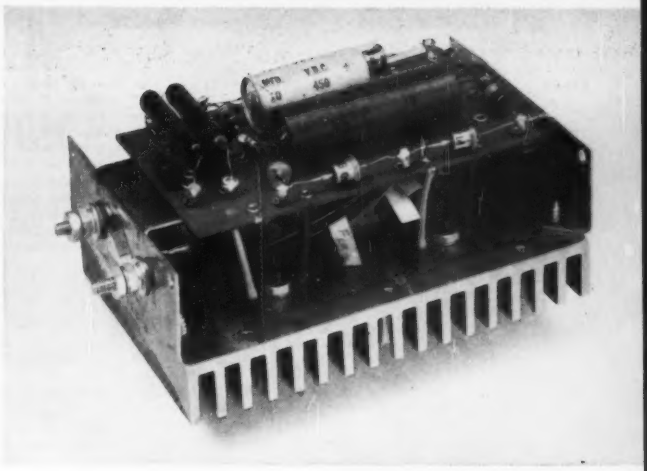
THE model designation above may tend to disguise the use of this device, but examination of the accompanying photographs will immediately identify it as a transistor power supply. The F. W. Sickles Division of General Instrument Corporation, Chicopee, Mass., has designed the supply especially for the amateur and general mobile communication use. It will furnish high-voltage d.c. power to operate both a transmitter and receiver from the low-voltage battery and charging systems of motor vehicles.

The supply is rated to deliver its maximum power output of 112.5 watts in continuous duty, a rating made possible by the heavy, ribbed cast-aluminum heat sink. This power can be obtained over a temperature range of minus 30 to plus 65 degrees Centigrade.

The supply uses four transistors in a power oscillator circuit. All four transistors have a common electrical collector connection, allowing the transistors to be mounted directly on the heat sink. Eight hermetically-sealed silicon rectifiers in a bridge circuit are used to rectify the 1850-cycle square wave from the power oscillator. A capacitor filter follows up the rectifiers and reduces the ripple to less than 2 per cent peak to peak. Over-all efficiency at full output from the high-voltage section is about 85 per cent. Voltage



The large area provided by the cast aluminum heat sink allows the supply to be rated for continuous duty at full output. Two output voltages are available at the three-post terminal strip.



View showing the supply with its perforated aluminum cover removed. Several of the silicon rectifiers can be seen mounted on the phenolic board along with various resistors and capacitors. The two large studs extending from the left side are the input terminals. The negative input terminal is grounded to the frame of the supply.

regulation from maximum load current to 50 per cent load current is 1.5 per cent. Input and output ratings are as follows:

	Transmit	*Receive*
Input	13.8 volts d.c. 9.4 amp.	13.8 volts d.c. 2.5 amp.
Output	450 volts d.c. 200 ma.	225 volts d.c. 100 ma.

These outputs are available simultaneously from the supply. The unit weighs 2.6 pounds and measures $3\frac{3}{8} \times 4 \times 6$ inches.

— *E. L. C.*

---

25 Years Ago
this month

January 1934

. . . The lead article described the construction of a c.w. and phone transmitter using some of the new tubes and circuits, this being the conclusion of a two-part article.

. . . The problems of doublet antennas and impedance matching were discussed, with the emphasis being on open-wire feeders and matching sections.

. . . There was also described a convertible push-pull oscillator or amplifier with approximately 30-watt output. (Bet you can't guess what type of tubes were specified!)

. . . A snappy piece of fiction, written by W5LS, featured as one of the principal characters a Soupy Groves, W5NW.

. . . Grammer told how to improve performance of the neutralized amplifier.

. . . W9BNC gave some helpful hints on how to get publicity for ham radio.

. . . R. S. Kruse related the story of the amateur and police radio, while K. B. Warner told how to get a Class C License.

. . . Back on the technical side of things, there was additional information on taming the Tri-tet oscillator, and three pages of miscellaneous ideas for the experimenter.

. . . Eight pages of ads by the National Company.

MEMBERSHIP CHANGES OF ADDRESS

Four week's notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W1AKE, Raymond G. Baxter, Lowell, Mass.
W1GMH, Carroll A. Currier, Manchester, N. H.
W1LUA, Leon F. Shoop, Great Barrington, Mass.
W1OIG, William E. Taylor, New London, Conn.
W2ATY, Stanley A. Walendowski, Jackson Heights, N. Y.
W2BY, Sheldon E. Brink, Walton, N. Y.
K2CAV, Cyril Waldman, Brooklyn, N. Y.
W2HXL, Eugene O. Adams, Staten Island, N. Y.
W2YT, Chester R. Underhill, Collingswood, N. J.
W3VBI, George F. Heinecke, jr., Lancaster, Pa.
W3ZHB, Gerald R. Young, Ellwood City, Pa.
W4LZO, Fred W. Hall, Jacksonville, Fla.
W5HCH, Robert W. Cochran, Fort Worth, Texas
W5WF, Frank M. Watts, jr., Shreveport, La.
W6DID, Anthony W. Strobin, Fresno, Calif.
W6DO, George B. McElwain, San Francisco, Calif.
K6KVB, Alphonse P. Jeannette, Hondo, Calif.
K6OBC, Patrick H. Burns, Stockton, Calif.
W6YIW, Donald P. Russell, Santa Cruz, Calif.
W7ETX, Stanley P. Velikanje, Yakima, Wash.
W7ND, David Mozes, Spokane, Wash.
W7OOG, Ivan La V. Gamett, Great Falls, Mont.
W8BMG, Harry C. Hartung, Kalamazoo, Mich.
W8DQT, Howard W. Greene, Marquette, Mich.
K8ERK, Edward T. Thornton, Marquette, Mich.
W8HZU, Edgar W. Morgan, jr., Charleston, W. Va.
KN9HMU, John G. Taylor, Lafayette, Ind.
W9RXS, Irwin J. Waldman, Milwaukee, Wisc.
W9TGD, William Telizyn, Riverside, Ill.
WØFRH, Walter E. Van Valkenburg, Fort Dodge, Iowa
KP6AK, Otto H. Hornung, Jarvis Island
VE7CB, Thomas C. Brown, Victoria, B. C.

• Technical Correspondence

RE VOICE KEYING

926 Cedar Lane
Northbrook, Ill.

Technical Editor, *QST*:

Your October article on a voice key for the handicapped by VE4VJ reminds me of a device I designed and built some ten years ago which performed a similar function. My gadget was also for the handicapped — in this case, deaf parents who were unable to hear their infant cry. The "Electronic Babylight," as I called it, also converted sound impulses into relay closure and since its design is considerably less sophisticated than that described by VE4VJ I am passing it along for those who may be considering the construction of such a unit.

As can be seen from the diagram, a conventional 4-inch loudspeaker coupled through an output transformer drives a resistance-coupled amplifier which in turn drives a biased triode into conduction. A sensitive relay in the plate circuit of the triode was used to turn on a remotely located 117-volt lamp. The relay used in the original unit closed on about 4 ma. and the bias resistor in the center tap of the power transformer was adjusted for 2 ma. of 6J5 current with no speech input. Substitution of a paralleled 6SN7 will result in more plate current swing and enable use of relays which require 10 to 15 ma. The 0.5-μf. capacitor across the relay may have to be reduced in value to follow rapid keying. If this design is used near an unshielded rig, r.f. rectification may occur in the 6SC7 grids, which are 10 megohms above ground. This can be prevented by the usual 1000-ohm grid series resistor and 100-$\mu\mu$f. grid-to-ground bypass which we still have to hang on high-μ audio stages of radios and TV receivers.

A local service organization built around 75 of these units after the story was publicized in the newspapers and I imagine some of them are still going strong.

Although it has no direct bearing on ham radio, the following sidelight on the initial trial of the Babylight should appeal to those with an engineering background. The unit was set up by the baby's bedside and when baby cried, the 6-watt test lamp in front of the device flashed on. This sudden appearance of light surprised the baby and she stopped wailing. How often this cycle of start and stop occurred is not too clear in my memory but I remember stating that here was an entirely new form of negative feedback, the details of which could not be found in any engineering text!

— *Jack Najork, K9ODE*

ANYBODY HELP?

325 Seymour St.
Vancouver 2
British Columbia
Canada

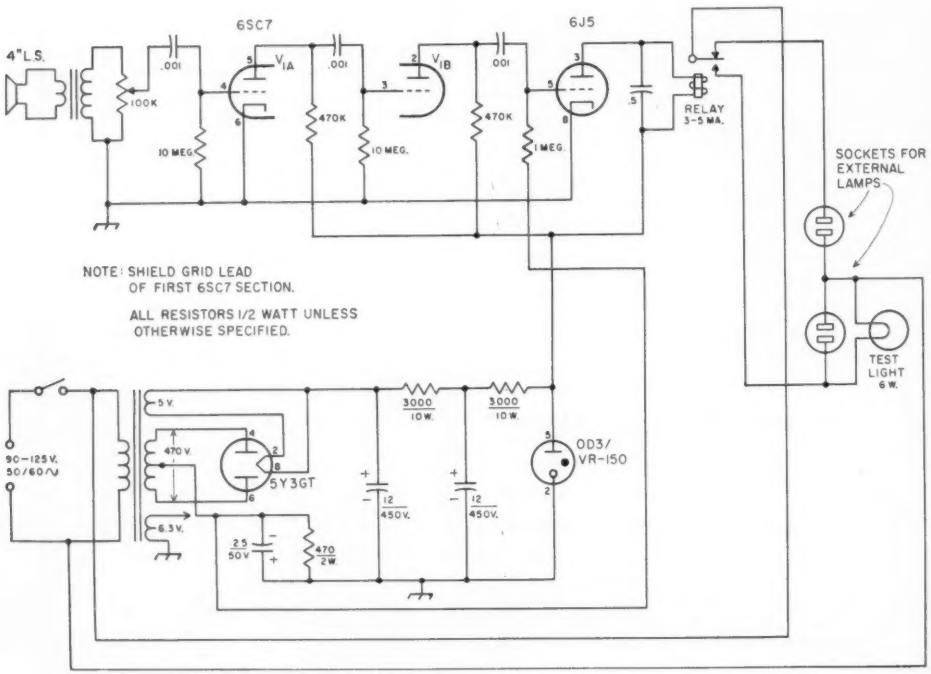
Technical Editor, *QST*:

The operation of marine mobile involves techniques which are in some way similar to ordinary mobile, but the employment of radio on small pleasure craft involves additional considerations which are totally foreign to land mobile operation.

Some of the problems which I have encountered no doubt have been experienced by many other marine mobile operators and I am by no means an authority. However, in the interests of, shall we say, getting the ball rolling for the thousands of hams who find themselves "at sea" as did I, articles on the following subjects would make most interesting reading:

First, equipment demand, which is greater than in the usual mobile installation. Mobile equipment to be most useful should embody both ship-to-ship, ship-to-shore

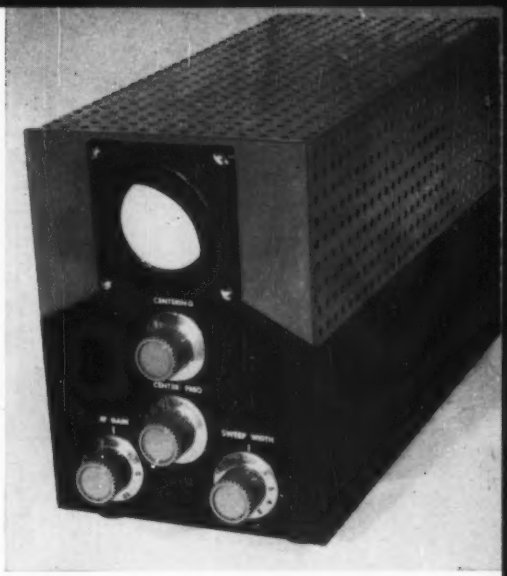
(*Continued on page 160*)



The Electronic Eyeball

Complete Panoramic Adapter in One Package

BY LOUIS I. HUTTON,* WØRQF



The "electronic eyeball" is a panoramic adapter using a 2-inch oscilloscope.

For a number of years a smart small core of hams has enjoyed the benefits of "panoramic reception," an electronic representation of the portion of the spectrum to which the receiver is tuned. If you would like to be "one of the boys," this article is for you.

FOR SOME time I had been collecting parts for a home-built receiver project. This receiver was to have included a panoramic display as one of its features. Before I had accumulated all of the parts there became available on the market several amateur communication receivers that meet my requirements. The only thing lacking was the panoramic display. I dropped my plans for a home-built receiver in favor of a commercial unit and proceeded to build the panoramic display for the new receiver.

The unit described here is an adaptation of the "Snooper" built by W7HEA.[1] It consists of a low-frequency superheterodyne receiver whose local oscillator is frequency-modulated by the same sweep generator that drives the horizontal sweep circuit of the display indicator (2-inch oscilloscope). As the local oscillator is swept back and forth across the band the received signals are detected and fed to the vertical circuit of the display indicator. Each signal appears as a vertical pip above the horizontal base line, as shown in Fig. 1.

* 2608 South Fern, Wichita 13, Kansas.

[1] Bishop, "The Snooper," *CQ*, Aug., Sept., 1952.

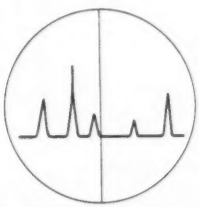


Fig. 1—Typical display of a panoramic adapter ("electronic eyeball"). Each "pip" represents a signal on the band; a strong signal will rise higher than a weak one. The pip corresponding with the center vertical line represents the signal to which the receiver is tuned. As the receiver is tuned across the band, the pips move sideways. If the deviation is decreased, the presentation is expanded until only one pip will occupy the entire screen.

This device is an aid to more efficient operation, like other auxiliary equipment found in the ham shack (Q5-er, *Q* Multiplier, secondary standard, etc.). Band conditions on and around the received frequency may be observed. Also, some of the characteristics of the received signal can be determined, such as splatter, carrier shift, relative carrier strength, and spurious signals. The netting (zero beat) of several stations on one frequency is made much easier.

The Circuit

Looking at the schematic diagram of Fig. 2 we find many familiar circuits. The 6AB4 detector uses the infinite-impedance circuit described in Chapter 5 of *The Radio Amateur's Handbook*, 1957 edition. The 6AK5 reactance modulator circuit is the same one that is used in many amateur narrow-band frequency-modulated transmitters; it is described in Chapter 11 of the same handbook. A voltage-doubling circuit provides the negative voltage for the 2AP1 indicator tube. The 12AX7 serves as a sawtooth generator and amplifier to drive the reactance modulator and the horizontal plates of the indicator tube.

The power switch is mounted on the r.f. gain control. The 100K intensity control adjusts the brightness of the display; it is set at mid-rotation for initial adjustment. Two focus controls are

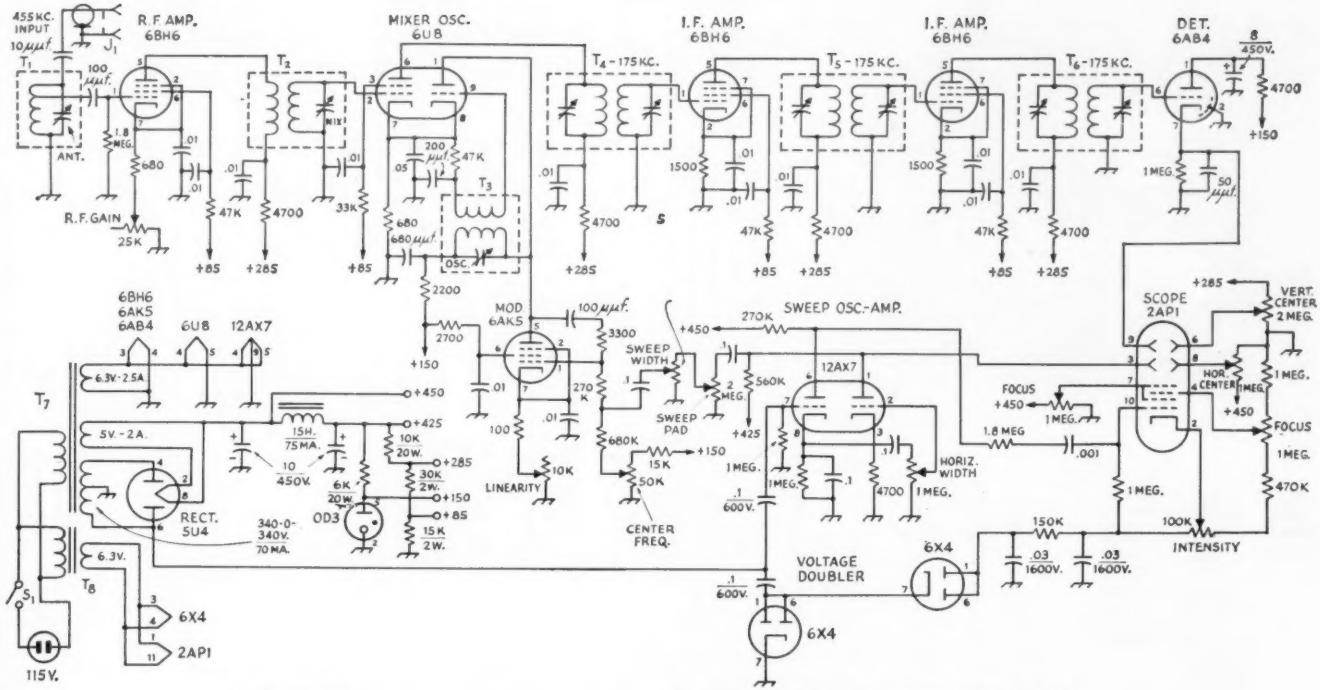


Fig. 2—Circuit diagram of the panoramic adapter. Unless otherwise indicated, capacitances are in μf., resistances are in ohms, resistors are ½ watt. Potentiometers are carbon, linear taper.

J_1—Phono jack.

S_1—Switch on r.f. gain control.

T_1, T_2, T_3—From BC-453 receiver; see text. Capacitors are 130-μμf. compression trimmers (El Menco 302).

T_4—175-kc. input i.f. transformer (Merit BC-300 or Miller 012-K1).

T_5—175-kc. interstage i.f. transformer (Merit BC-301 or Miller 012-K2).

T_6—175-kc. output i.f. transformer (Merit BC-303 or Miller 012-K4).

T_7—680 v. c.t. at 70 ma., 6.3 v., 5 v. (Stancor PM-8408).

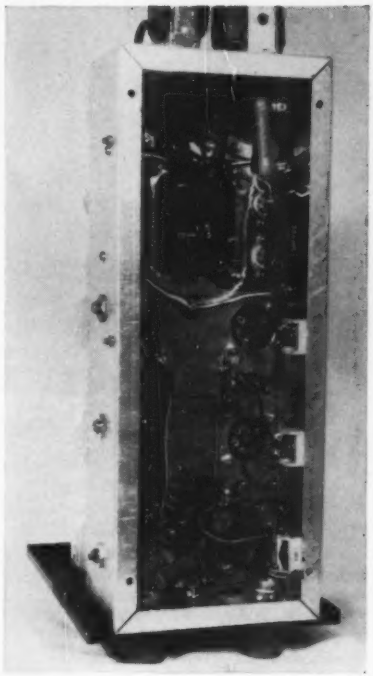
T_8—6.3-volt 1.2-amp. filament transformer (Stancor P-6134).

interacting and control the focus of the horizontal base line. The horizontal centering control on the front panel, and the vertical centering control on the vertically-mounted indicator tube bracket, control the position of the display. A horizontal width control adjusts the width of the base line. The sweep pad control, located on the side of the chassis, is a rough adjustment of the amount of radio-frequency spectrum that is to be viewed, and the sweep width control located on the front panel is a fine adjustment of the same function. Also on the front panel, the center frequency control enables the operator to center the received signal on the base line. A linearity control, located on the side of the chassis, adjusts the linearity of the sweep of the local oscillator and interacts with the center frequency control.

Construction

Fig. 3 shows the layout of the major components. To reduce the crowding of components inside the chassis, the filter choke and the heater transformer are mounted on the outside back apron. The hood over the display indicator was made from a scrap piece of tin. The antenna, mixer, and oscillator coils were removed from a surplus BC-453 receiver, although tuned circuits from 455-kc. i.f. transformers might be substituted. The cover of the unit was formed from Reynolds perforated aluminum sheet.

Many of the new amateur communications receivers are of the dual conversion type and use a first conversion frequency around 2 Mc. This unit can be made to work at 2 Mc. by substituting broadcast-band receiver coils for the low-frequency antenna, mixer, and oscillator coils. For example, these could be Miller Type 44-A an-



A view under the chassis shows the mica-compression trimmers used to tune the r.f., mixer and oscillator circuits.

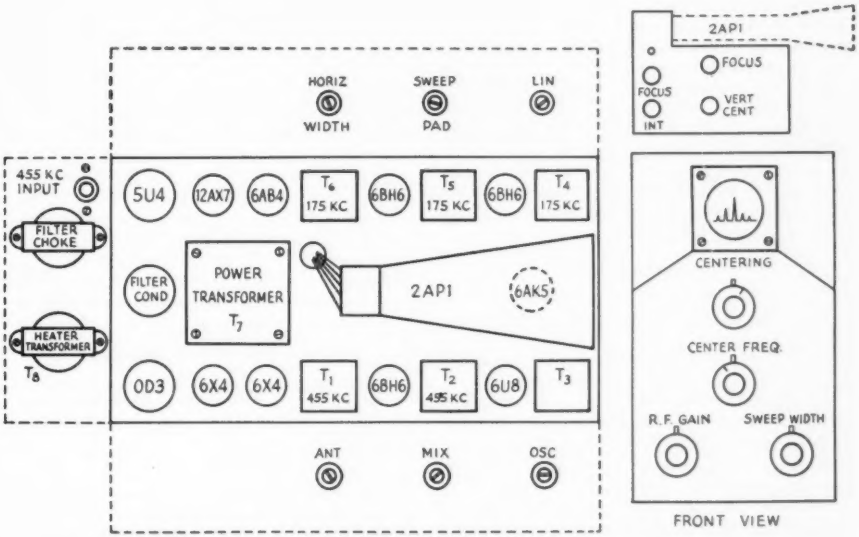
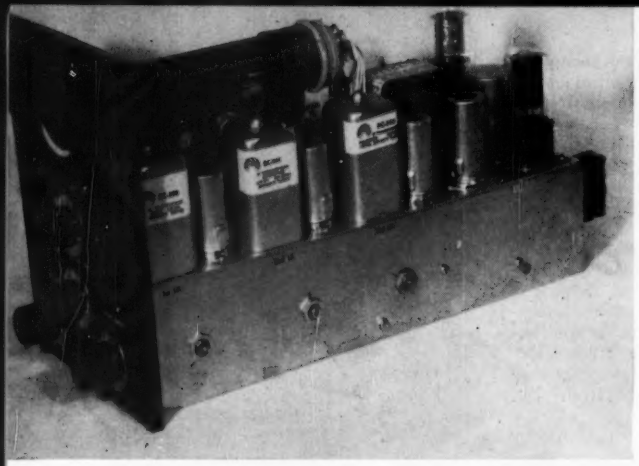


Fig. 3—Parts arrangement on the 5 × 13 × 3-inch chassis. The front panel measures 6 by 8 inches.



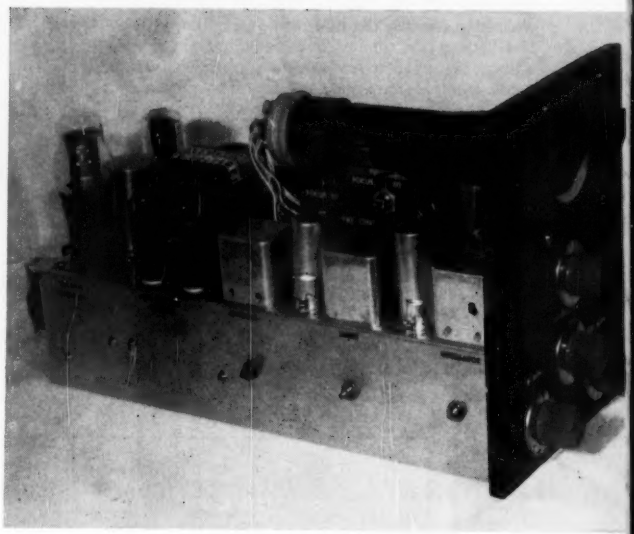
Side views of the panoramic adapter show how the controls have been brought out on both sides of the chassis; note also the controls on the panel under the scope tube.

tenna, Miller Type 44-RF mixer, and Miller Type 44-0 oscillator coils.

Adjustment

The initial tuning and adjustment of the unit is similar to the alignment of any superheterodyne receiver, as described in Chapter 5 of *The Radio Amateur's Handbook*, "Alignment and Servicing of Superheterodyne Receivers." A slight amount of stagger tuning of the r.f. and mixer coils is necessary to achieve a more even response curve.

Connecting the unit to the receiver is simple. Install a phono jack on the rear apron of the receiver chassis. Then connect one end of a short length of RG-59/U coaxial cable to the phono jack. The center conductor of the other end of the cable is connected to one side of a 3-$\mu\mu$f. capacitor; the other from the capacitor is connected to the plate of the second converter stage (455 kc.) of the receiver. No realignment of the receiver was required. Ground the shield of the coaxial cable at the phono jack only.



Operation

The following information should be of assistance in interpreting the information on the display indicator.

Carrier Shift: This is indicated by a sidewise movement of the pip under modulation.

Modulation: When the carrier is modulated 100 per cent, the height of the pip will double.

Splatter: This will be visible as smaller pips on either side of the received signal, and will appear and disappear with modulation.

Netting: Zero beating your signal with the received signal is accomplished by moving the pip from your v.f.o. to coincide with the received signal.

As described, the unit is capable of displaying signals 20 kc. either side of the center frequency of 455 kc.

The writer wishes to thank Mr. Howard Louth, WØSMI, for photographing the equipment.

QST

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One of the remaining bargains in World War II surplus is the little BC-454 receiver. Although its selectivity does not compare with that of a good communications receiver, it is first-rate in every other respect. In this article W1ICP describes the few modifications and accessories necessary to put it to work in the ham shack.

Getting Started with the BC-454

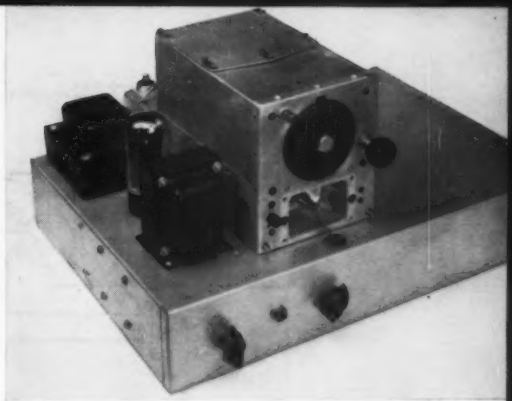
An Inexpensive 80-Meter Receiver

BY LEWIS G. McCOY,* W1ICP

THE BC-454 receiver[1] described in this article is part of the Model AN/ARC-5 transmitting-receiving equipment used in military aircraft. This particular receiver tunes from 3 to 6 Mc., taking in WWV at 5 Mc. and the 3.5- to 4.0-Mc. amateur band. A look through the ads of radio distributors handling surplus equipment will show that this receiver sells for five to ten dollars, depending on its condition.

Right about here the reader is going to wonder what kind of receiver can be purchased for such a small amount of money. First, let's discuss the circuit. The receiver is a superheterodyne with one r.f. stage and two i.f. stages. The audio output is sufficient to drive a loudspeaker. Mechanically, the receiver could be classed as "rugged." The tuning capacitor is driven through a worm-and-gear combination, using spring-loaded gears to minimize backlash. An accurately calibrated tuning dial is driven by the gear assembly. The tuning rate is excellent; 30 turns of the tuning drive completes the 3-Mc. coverage. All in all, the receiver is an excellent buy, particularly for the beginning amateur.

We've talked about the good features, but what about the bad? For one thing, the receiver was designed for remote operation. In order to make it usable in the ham shack it is necessary to add a gain control, b.f.o. switch, and a headphone jack. Also, the receiver has no power supply. However, as you read on, you'll see that this is no real problem since the construction



This BC-454 receiver has been mounted on a large chassis that provides space for the power supply and any future accessories that might be added. Two knobs on the chassis switch the power supply and the b.f.o.; the jack is for the headphone plug.

of a suitable supply is easy and straightforward. One more point on the credit side, the receiver makes an excellent tunable i.f. for use with crystal-controlled converters.[2] As it comes, the BC-454 has no tuning knob or shaft, since the original unit was tuned by a spline-coupled cable. However, suitable spline couplers are sold by several of the dealers around the country.

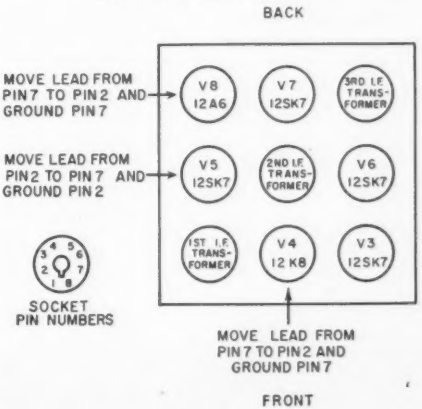
In this article we'll show a simple method of converting the heaters for 12-volt operation (they're wired for 24 volts in the original condition). Also, we'll describe a suitable power supply and tell how to connect the b.f.o. switch, gain control, and headphone jack.

Modifications of the BC-454A or B

The first step in modifying the receiver is to

[2] *The Radio Amateur's Handbook*, receiving chapter.

Fig. 1—This drawing shows the simple steps necessary to convert the heater wiring from 24- to 12-volt operation. Two metal-cased capacitors directly over V_5 and V_8 must be moved out of the way temporarily to provide access to the tube sockets.



* Technical Assistant, *QST*.

[1] The BC-454A or B is the Army and Air Force designation. The same receiver carries a Navy number of R-21.

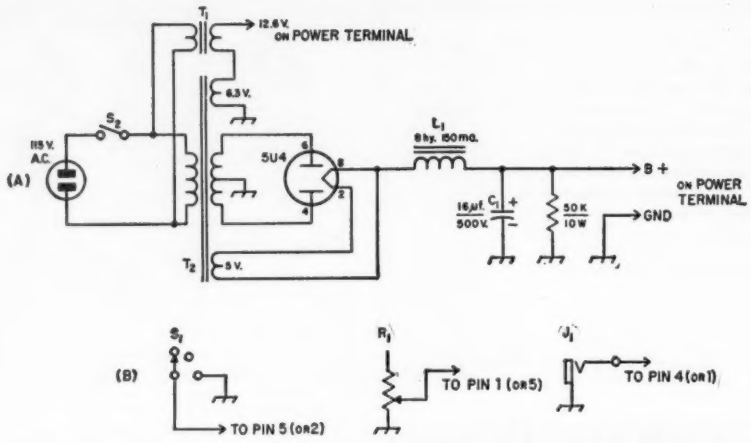


Fig. 2—(A) The power supply. (B) The three components, b.f.o. switch, gain control, and headphone jack. Refer to Fig. 3 for the correct connections at the receiver plug.

C_1—16-μf. 500-volt electrolytic capacitor.
J_1—Phone jack.
L_1—8-h. 150-ma. filter choke (Thordarson 20C54, Triad C10X).
R_1—25,000-ohm 2-watt potentiometer.
S_1—1-pole 3-position switch with a.c. switch S_2 mounted on back (Centralab 1465).
S_2—See S_1.
T_1—6.3 volts, 6 amp. (Thordarson 21F11, Triad F-18 X).
T_2—600 volts, center-tapped, 120 ma., 6.3 volts, 5 amp., 5 volts, 3 amp. (Thordarson 22R05, Triad R-12 A).

change the heaters for 12-volt operation. First, remove the bottom plate from the receiver. Refer to Fig. 1 for the wiring changes. This drawing shows the location of the various tube sockets, as viewed from the *bottom*. When moving the two capacitors to provide access to sockets V_5 and V_8, *don't* unsolder the capacitor leads; it isn't necessary.

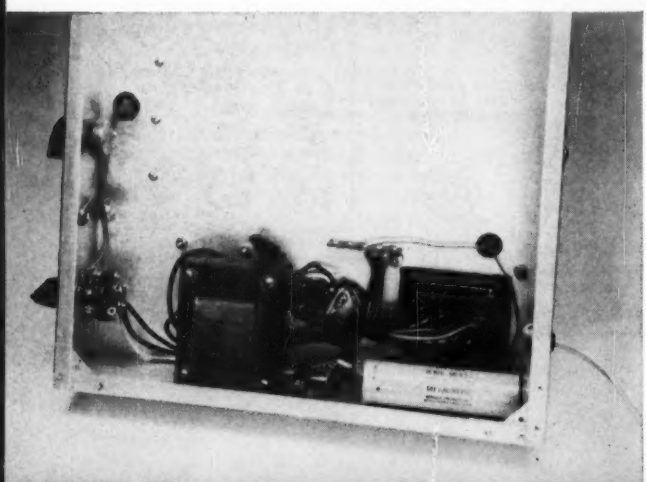
Examine the three tube sockets and locate the heater terminals before attempting to remove the leads. You'll find that the leads are wrapped around the terminals and soldered. A Hytron soldering aid is a handy tool for removing this type of connection. Heat the terminal enough to melt the solder and unwrap the connection. Don't cut the leads or they'll be too short to reach the other terminal.

When we say "ground pin so and so," we mean to connect a short length of wire from that terminal to the nearest chassis ground point. Making the changes described in Fig. 1 is all that is required to change the heaters from 24- to 12-volt operation.

External Connections

In addition to the change in heater wiring, it is necessary to provide a power supply, a gain control, a headphone (or loudspeaker) connection and a b.f.o. switch. The circuit for a suitable power supply is shown in Fig. 2A, and the connections to the gain control, the headphone jack and the b.f.o. switch are given in Fig. 2B.

The pin numbers in Fig. 2B refer to the front-panel socket on the BC-454 receiver. Immediately below the receiver dial there is a square metal plate with a knob on it. By removing the screws at the four corners, the plate can be pulled out, revealing a 6- or 7-prong socket (depending upon the model). The pin numbers in



A 6.3-volt transformer mounted under the chassis brings the available heater voltage up to 12.6.

Fig. 2B can be found by reference to Fig. 3 and the particular receiver you have.

You could solder the leads to the pins but a cleaner method is to buy a Cinch octal socket and pull six contacts out of the socket. The contacts can be used as clips to fit over the pins. Also, after soldering the clips to the leads, cover the clips with spaghetti insulation so there will be no danger of shorting when they are clipped over the plugs in the receiver.

Three leads are required to make the connections from the power supply to the receiver. One lead is for the heater voltage (12.6), and the other two are for the B+ and common (ground). These leads are brought up through the top of the aluminum chassis near the back of the receiver. Clips are also used to connect the leads to the power terminal at the back top of the receiver (see Fig. 3C).

The Power Supply

The power supply (Fig. 2A) is capable of powering not only the receiver, but converters or other equipment. If the reader is only interested in 80-meter operation there is of course no need to build the power supply described here nor to mount the BC-454 on a chassis. Thinking along the lines of adding converters or other gear, a 3 × 12 × 17-inch aluminum chassis was used for the larger power supply and for mounting the receiver itself.

Power transformers and chokes, such as those used at T_2 and L_1, need not be exactly as specified for the receiver to work. The voltage and current requirements are approximately 250 volts at 70 ma. However, if you want to add converters you may need as much as 50 to 60 ma. additional current, so let's say 250 volts at 120 ma. is required.

Because we have some flexibility in the power requirements, there are a couple of ways an amateur can possibly save a few dollars. There are probably umpteen jillion transformers and chokes taking up space in amateur junk boxes. In many instances this equipment could be used for the power supply. It might be wise to get your ham buddies to take inventory and then, with a little smart horse trading, you might wind up with a very inexpensive power supply. As long as you have a transformer that will give between 200 and 300 volts d.c. out of the filter at the necessary current, you can use it.

Another source of power transformers and chokes is old TV sets. More and more of the early model transformer-type sets are hitting the junk piles, and they make an excellent source of electronic supplies for the enterprising beginner. Nearly any TV set ever made, that used a power transformer, can be pirated for the necessary parts. Any such transformer certainly has adequate power ratings and the voltages will likely be in the ranges listed earlier. You may have to borrow a voltmeter to determine what winding is what, but here again you should be able to enlist the help of the local club or another ham.

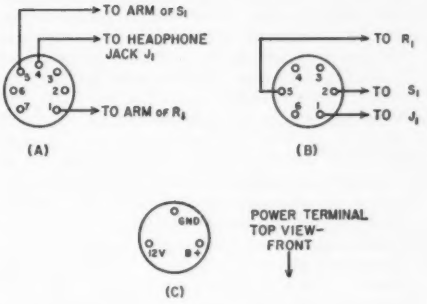


Fig. 3—Shown at A and B are the two types of control plugs in different models of the BC-454. Some units have 6-pin plugs and others 7 pins. This drawing shows the plugs as viewed from the front of the receiver.

The drawing at C shows the power plug at the top rear of the receiver.

In the supply itself there is nothing complicated about wiring or layout. In order to obtain the 12 volts for the receiver heaters it is necessary to connect two 6.3-volt windings (or transformers) in series. When the two windings are correctly connected you'll have 12 volts available. We say correctly because if the windings are connected the wrong way they will "buck" each other and give nothing. An a.c. voltmeter will quickly show you when you have the correct connections. (Many of the TV type transformers have several 6.3-volt windings, and a few have 12 volts available.)

A multiple-terminal tie point is used when making the heater-winding connections. The junction of the two windings will provide a 6.3-volt tap which can be used for heaters of the tubes used in the future additions.

The BC-454 is mounted close to the power-supply components and the back edge of the receiver is even with the rear of the chassis. Three screws at the front and one at the rear are used to hold the receiver to the chassis.

After you get the power supply wired and the receiver hooked up, it should be ready to go. Connect an antenna to the antenna terminal (upper left-hand front corner). Plug in a pair of headphones and turn the unit on. There is an antenna trimmer at the left-hand side of the front panel and the trimmer should be peaked for maximum signal. The b.f.o. pitch adjustment is accessible through a small hole on the side of the chassis near the rear.

We tried the BC-454 with a 10- and 15-meter converter[3] and the result was very gratifying. The combination made an excellent three-band setup. As we mentioned earlier, the BC-454 is a good unit for the beginning amateur. Building the power supply and making the receiver modifications are excellent ways for the newcomer to obtain some practical experience. QST

[3] McCoy, "The 'Bonus' 21-Mc. Converter," *QST*, Oct., 1958.

Bell Break

A System of Automatic Break-In for RTTY

BY GORDON P. STANYS,* W1OUG

During the past three years interest in amateur radioteletype has been increasing rapidly, and as a result of this expanding interest a method affording a rapid exchange between two radioteletype stations is becoming increasingly popular. Use of this "bell-break" system, as it is called, provides one of the few thrills left for the amateur seeking new methods of rapid and efficient communication. Through the simple act of depressing a key on his keyboard the sending operator can shut off his transmitter and at the same instant turn on the transmitter of another station many miles away.

Although the idea is not new, it is only recently that some of the more active RTTYers have begun to put the system into practice. The bell-break system was first proposed by Fred Wise, W3LGK, in a letter to the FCC dated January 9, 1956. Subsequent correspondence with the Secretary of the FCC confirmed the legality of this method of operation in amateur work.

How It Works

Although the bell-break system is very simple, it is quite effective in its performance. Contained in every teletype machine is a signal bell which can be made to ring through mechanical means. Whenever the transmitting operator strikes the key labeled BELL on his teletype keyboard a lever located at the back of the machine is actuated, striking the bell. This also occurs at the receiving machine, jarring the operator from his reverie.

This function — or "stunt," as it is called — can be used to turn off the transmitter at station *A* and to turn on the transmitter at station *B* When the operator at station *B* has finished with his reply he merely repeats the above procedure. (Of course, after a lapse of ten minutes the stations must identify themselves.) It is obvious that this provides for efficient and rapid exchange of information and ideas. It can also be used to awe visiting firemen by having lights go on and off along with the rig.

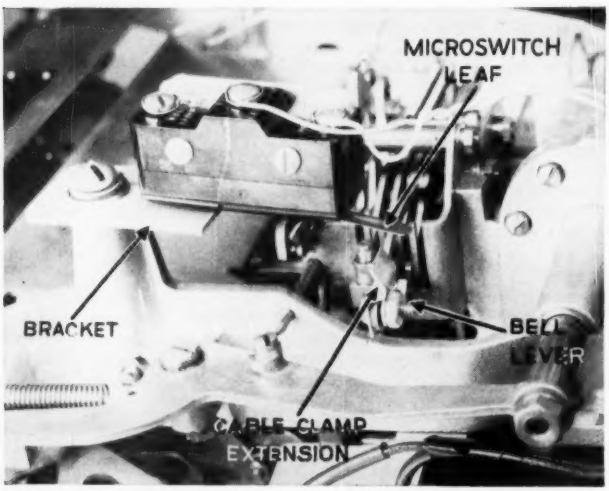
Installation Details

All that is needed to get this system hooked up and working are two items that are cheap and easily obtainable, a microswitch and a latching relay. The total cost is under $8.00. The microswitch should be the single-pole single-throw type with leaf instead of roller, and the latching relay can be a Guardian RC-100-AR 4PST.

The microswitch is mounted on a metal bracket made from a piece of steel or aluminum angle stock, with part of one side of the angle cut away to provide clearance for the bell lever to strike the leaf of the microswitch. The bracket in turn is bolted to the machine frame, using an existing ¼-20 threaded hole in the casting near the signal bell, which has been removed for this purpose. If another method of mounting can be figured out the signal bell may be left on, but in the author's case this proved to be the simplest solution. If some form of audible signal is desired, the microswitch can also be used to ring the front door bell, thereby driving the XYL to distraction.

The weight or clapper on the bell-ringing lever should be removed and a small metal extension bolted on so that when the lever moves forward it

* 27 Wardwell St., Stamford, Conn.



The microswitch mounts on a bracket using the ¼-20 threaded hole in the casting. The bell clapper is extended, by bolting on a small cable clamp, so the leaf actuator of the microswitch can be momentarily pressed to close the switch contacts when the "Bell" signal is received.

will strike the leaf on the microswitch and close the circuit to the latching relay. In the author's case a small metal cable clamp served perfectly. The photograph shows the method of mounting the microswitch and bracket to the machine frame and also shows the cable clamp bolted to the end of the bell lever.

Switching Circuits

On the right-hand side of the table that comes with the machine are three ganged switches. One of these can be used to disable the bell break when it is not wanted. This switch should be wired in series with the microswitch contacts.

On the left side of the keyboard, mounted in the casting, is a break button switch. Normally, when this button is depressed it opens the circuit to the printer magnet. This button can easily be modified as follows: Remove the two wires going to the button, solder them together, tape them up and tuck them out of the way. Remove the button from the casting by pushing on the button from the under side. Unscrew the two curved copper contacts from the button and turn them around so that when the button is pushed the contacts close instead of opening. Some trimming of the length of the curved contacts may be necessary. Replace the button in the casting and wire it in parallel with the microswitch contacts. If the machine does not come equipped with a break button, an ordinary push button will suffice.

All of the wiring is contained under the table. The existing terminal boards and the a.c. outlets under the table can be used to advantage as a source of power for the latching relay.

The break button provides manual control of the bell-break circuit if during a QSO a false bell-break signal is received, causing the transmitter to be turned on. The button switch can be used to turn it off quickly and minimize loss of incoming copy. Manual control is an essential item; the loss of copy and confusion experienced by the author on several occasions without it has proved its worth. A bonus is that the break-button switch gives you single switch control of the station for phone or c.w. when not operating RTTY, since the latching relay can still be actuated without turning on the printer.

Relay Wiring

Of several latching relays available on the market the Guardian relay mentioned earlier is the cheapest. This relay is of the mechanical latching type and will latch into the closed-contact position when actuated by a short energizing pulse. A following pulse will unlatch it into the open-contact position.

At W1OUG one set of contacts is used to turn on the transmitter driver stage by being connected in parallel with the plate-supply switch for the driver. The second set of contacts closes the cathode keying circuit of the v.f.o. and buffer stages. The high-voltage supply to the final is left on all the time. The remaining contacts are spares in the event that some other switching function is desired in the future. Originally the idea was to have the third set of contacts operate a heavy-duty relay to switch on the high-voltage supply to the final. This was found to be unnecessary and only added to the wiring. The contacts on the latching relay are rated for 12.5 amperes, so are adequate for transmitters up to 500 watts input without the need for additional relays.

A means must also be provided for opening the cathode circuits of the v.f.o. and buffer stages so that during a teletype transmission c.w. identification can be made. This can be done by wiring one of the remaining two of the three ganged switches in series with the set of latching-relay contacts that closes the cathode circuit. When this switch is opened the carrier goes off and the transmitter can be keyed in the normal way.

Using the System

This description of the author's installation is intended only to give the reader an idea of the ease and simplicity of installation. Those amateurs who already have single-switch operation of their stations will find installation to be simple and straightforward.

As with nearly every simple system or idea there is one catch. This method of break-in cannot be used in nets or round tables. If it is, fifteen transmitters will come on the air at once and fifteen manual button switches will have to be pushed to restore things to normal. But there is hope. Some bright fellow might figure out a way of using stepping relays (similar to the telephone dialing system) with individual stations in the net assigned different numbers or pulses. Perhaps the use of resonant relays might be the answer.

Owners of tape equipment can make further use of the bell-break idea. The author has made a perforated CQ tape with the bell signal inserted between two lines of "CQ de W1OUG." Mention is made on the tape that the station calling CQ is using bell break and for the receiving station to zero to the frequency. When the break signal comes along on the tape it shuts off the transmitter of the station calling CQ and turns on the transmitter of the station printing the CQ call. The receiving operator then identifies himself and contact is established with a minimum of CQing. Meanwhile, if no answering calls are forthcoming the tape continues on through and puts the station desiring a contact back on the air. With the use of some form of selective system the entire roll call of a net could be taken in this way.

The FCC requires identification on both RTTY and c.w. after ten minutes of operation. If the day ever comes when this is no longer required, bell break and systems like it will have come into their own. Then the voice-control boys will have nothing on the RTTYer.

This method of operation is fascinating and a lot of fun — particularly when you hear the snap of the relay and the pilot lights come on and you realize that a fellow who may be a thousand miles or more away has turned on your transmitter by remote control. Try it and see. QST

Here's a simple method of calibrating over a wide range of s.w.r. values with only one dummy-load resistor, using a variable capacitor to adjust the s.w.r. value at the load. It can be used at any power level for which a resistive dummy that matches the line characteristic impedance is available.

Adjustable Load for Calibrating S.W.R. Bridges

BY ROBERT C. BUNCE,* K6QHZ

THE calibration procedure described below gives true standing-wave-ratio readings with all types of s.w.r. instruments, and is a convenient method to use since only a single dummy load is needed. In brief, the procedure consists of adding reactance (in this case, capacitors) in series with a dummy load of the same resistance as the characteristic impedance of the line with which the s.w.r. bridge is to be used. By thus making the load reactive, it is possible to obtain various values of s.w.r. The formula for determining the size of series reactance required is:

$$X = Z_o \sqrt{\left(\frac{s.w.r.^2 + 1}{s.w.r.}\right) - 2}$$

X is the value of reactance in ohms, Z_o is the characteristic impedance of the line *and* the resistance of the dummy load, usually about 50 or 70 ohms, and *s.w.r.* is the required s.w.r. The X value can then be converted directly to micromicrofarads (or microhenries, if you happen to have some calibrated coils around) at the frequency of calibration by use of a reactance chart or formula ($X_c = 1/2\pi fC$), as explained in the ARRL *Handbook*.

The values of series capacitors required for both the 40-meter and 15-meter bands, for various values of s.w.r., are given in Table I, one column for 50-ohm instruments, the other for the 70-ohm variety. To set up each load, simply insert a capacitor of the value listed (or calculated) in series with the dummy load, and connect the combination to the load terminals on the s.w.r. meter. The writer used a 500-$\mu\mu$f. straight-line-capacitance variable set for the desired capacitance on the basis of percentage of total rotation — i.e., when the capacitor is half closed we have 250 $\mu\mu$f., and so on. For values above 500 $\mu\mu$f., fixed 10 per cent tolerance capacitors can be connected in parallel with the variable.

If you have several 100-$\mu\mu$f. fixed capacitors around, you can use them to calibrate an s.w.r. scale instead of setting up the values in Table I. The s.w.r. resulting from series and parallel combinations of 100-$\mu\mu$f. capacitors in series with 50- and 70-ohm dummy loads on the 40-meter band (7200 kc.) and 15-meter band (21,300 kc.) are given in Table II.

To make up a calibration curve, list the s.w.r. values in a column, and list the meter readings obtained in the "reflected" position beside the corresponding values of s.w.r. (Remember *always* to adjust the sensitivity potentiometer for a full-scale reading in the "forward" position —

* Gonset Division, 801 S. Main St., Burbank, Calif.

Table I

Series Capacitance Required at 7 and 21 Mc. for Selected Values of S.W.R.

S.W.R.	Reactance (Ohms) Required		Capacitance ($\mu\mu$f.) Required, 7200 kc.		Capacitance ($\mu\mu$f.) Required, 21,300 kc.	
	50-Ohm Load	70-Ohm Load	50-Ohm Load and Line	70-Ohm Load and Line	50-Ohm Load and Line	70-Ohm Load and Line
1.2:1	9	13	2460	1760	830	593
1.5:1	21	29	1050	752	356	254
1.8:1	30	42	735	525	249	178
2.0:1	35	49	630	450	214	153
2.5:1	47	66	470	336	159	114
5.0:1	90	126	246	176	83	59
10.0:1	142	199	155	111	53	38
20.0:1	210	294	105	75	36	26
50.0:1	350	490	63	45	21	15

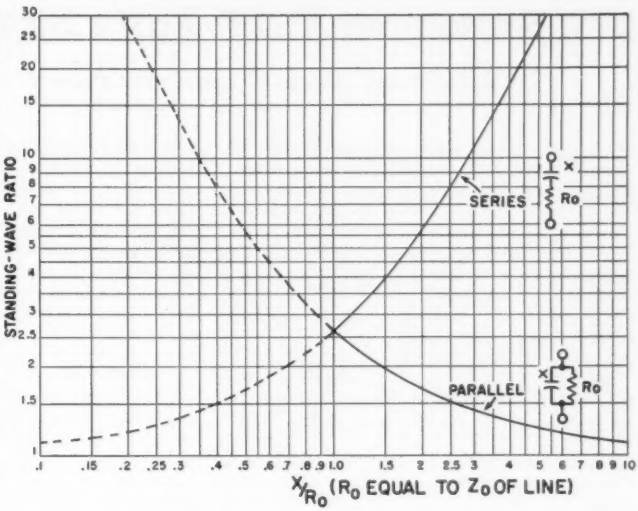


Fig. 1—Values of reactance required to be inserted either in series or parallel with a resistance equal to the characteristic impedance of the line, for obtaining various standing-wave ratios for calibration purposes. Values of reactance read from the chart are "normalized" to the line impedance and must be multiplied by the characteristic impedance of the line to find actual values in ohms. The resistive dummy load, R_o, must accurately match the line impedance. Reactance values can be converted to capacitance (or inductance, since either may be used) by the usual formulas or with the aid of reactance charts such as are given in the chapter on circuit fundamentals in the Handbook.

if the instrument has such a control — before switching to the "reflected" position and recording the meter reading.) The table can be used by itself, or you can plot the resulting curve on two-cycle log paper. Calculated in this way, the readings should check out against a commercial instrument within 15 per cent.

Editor's Note: The information above originally was part of the author's article on the Mickey-Match,[1] but we thought the idea too good to risk its being "lost" to those who already have s.w.r. bridges, and therefore possibly would have overlooked it in the constructional details of the Mickey-Match. The method can, of course, be used for calibrating any s.w.r.-measuring instrument, at any power level for which a suitable resistive dummy load is available.

[1] Bunce, "The Mickey-Match," *QST*, November, 1958.

Table II

Standing-Wave Ratios for Selected Values of Series Capacitance, 7 and 21 Mc.

Series Capacitance ($\mu\mu$f.)	Standing-Wave Ratio	
	50-Ohm Load	70-Ohm Load
7-Mc. Band (7250 kc.):		
50	80:1	40:1
75	37:1	19:1
100	21:1	11.7:1
150	11:1	6.1:1
200	6.8:1	4.2:1
300	3.8:1	2.7:1
400	2.8:1	2.15:1
600	2.1:1	1.7:1
1000	1.5:1	1.35:1
21-Mc. Band (21,300 kc.):		
25	38:1	20:1
50	10.8:1	6.4:1
75	5.8:1	3.7:1
100	4.0:1	2.8:1
150	2.6:1	2.0:1
200	2.1:1	1.7:1
250	1.8:1	1.5:1
300	1.6:1	1.4:1
500	1.35:1	1.25:1

The s.w.r. *vs.* reactance data also can be presented graphically as shown in Fig. 1, and the idea can be usefully extended to include putting the reactance in parallel with the resistive dummy, as is also shown in Fig. 1. These curves, which are normalized to the line characteristic impedance and thus can be applied to any type of line, cross at the value $X/R_o = 1$, at which value the s.w.r. is 2.6 to 1. Thus (solid curves) s.w.r. values higher than 2.6 to 1 can be secured by putting X in series with R_o, and s.w.r. values lower than 2.6 to 1 can be secured by putting X in parallel with R_o: this is convenient because it means that a single variable capacitor having a minimum value $X = R_o$ at the measurement frequency can be used for the entire practical range of s.w.r. measurements. As a guide, the maximum capacitance required for the low-frequency end of each band is as follows:

Freq.	*52 Ohms*	*75 Ohms*
3.5	874 $\mu\mu$f.	605 $\mu\mu$f.
7	437 $\mu\mu$f.	303 $\mu\mu$f.
14	218 $\mu\mu$f.	151 $\mu\mu$f.
21	145 $\mu\mu$f.	101 $\mu\mu$f.
28	109 $\mu\mu$f.	76 $\mu\mu$f.
50	61 $\mu\mu$f.	42.4 $\mu\mu$f.

It should not be necessary, ordinarily, to calibrate a bridge at more than one frequency. Thus any available variable capacitor can be used, if the frequency is selected so that a reactance value numerically equal to the characteristic impedance of the line will be within the adjustment range of the capacitor. If desired, the calibration can be checked at a few points on lower frequencies by using fixed capacitors or combina-

(*Continued on page 156*)

September V.H.F. Party Summary

Big Turnout Despite Generally Poor Conditions

THERE was no aurora, no sporadic-*E* skip, and almost no DX of any kind. To make matters worse, a steady drizzle fell over much of the country to dampen the spirits of the many groups who took to the mountains for portable work. In the face of such conditions there might have been 100 participants who would have taken the trouble to submit logs a few years back, but the Fall V.h.f. Party, September 20 and 21, brought in 438 valid entries, from 49 ARRL Sections.

It is doubtful that the contest set any major records, other than perhaps for enthusiasm on the part of the participants, but the increase in activity and its wide geographical distribution are noteworthy. In the Chicago area, for example, W9ROS, Roselle, Ill., was able to work 270 stations on 50 and 220 Mc., for 2529 points. The highest total made in the eastern part of the country without using 144 Mc. was only one contact higher. This was the work of K2VIX, Lawrence, L. I., using 50 Mc. only. Frank worked 271 stations in 15 sections, for 4065 points.

Many areas where v.h.f. activity was formerly nonexistent, or at best very low, now turn in some rather remarkable records. Note that K4MBM, Huntsville, Ala., was able to work 91 stations on 50 Mc., without the help of any skip propagation, and W8UMF, North Royalton, Ohio, worked 210 stations on 6, for 1680 points. All these fellows, incidentally, are Technician Class licensees, yet they were the top men in the Illinois, NYC-LI, Alabama, and Ohio ARRL Sections, respectively. K2LZF, Greenfield Center, N. Y., won the WNY Section award with 226 50-Mc. contacts and 2938 points.

Though 50 Mc. continued its growth that can best be described as meteoric, the activity was by no means all on that band. K2MPT, Saddle Brook, N. J., worked an even 200 stations in 14 sections on 144 Mc., for 2800 points, the best 2-meters-only score. K1CRQ, Bethlehem, Conn., was close behind, with 171 contacts in 16 sections, for 2736 points.

The leading scorer among single-operator stations was W1RJA, Milford, Conn., with 331 contacts on 6 and 2 and a section multiplier of 32, for 10,592 points. W1RFU, Wilbraham, Mass., led the field in section multipliers, with 41. Bill worked 202 stations on 50, 144 and 220 Mc. for 9184 points. This included 22 contacts in 12 sections on 220 Mc.

The most versatile home stations were W1OOP, Needham, Mass., and W6NLZ, Palos Verdes, Cal., who used 50, 144, 220, 420 and 1215 Mc. in winning wallpaper for the E. Mass. and Los Angeles Sections. W1OOP knocked off a nice one in W1BJ/1 on 1296 Mc., a distance of some 70 miles.

Top spot among the portables was the work of W1BJ/1, atop Mt. Kearsarge, Warner, N. H. W1s JDF AZK PZA and RMH braved an entire week end of wind and rain, with only a small tent for shelter, yet they worked 472 stations on 5 bands, for 24,192 points. Their section total, 48, and their 220-Mc. score, 25 stations in 14 sections, were also the best reported in each department. High spots in their very wet week end were the contact on 1296 Mc. with W1OOP, and a 220-Mc. QSO with VE2NI. Preliminary spade work just prior to the contest had indicated that no 220-Mc. stations were on the air in VE2, but VE2NI and VE2AXY came to the rescue. With only a few days to spare, they built a 220-Mc. converter, and 832A transmitter and a 10-element Yagi, just for the contest, finishing the job just in time to provide W1BJ/1 with an extra multiplier!

The part the portables play in our spring and fall contests can hardly be overstated. There are 73 stations in the tabulation with portable status indicated. It would be a good story to be able to describe the trials and tribulations these fellows went through in order to make the party more fun for the rest of us. But all we have room for is a heartfelt "Well done!" Just about everyone's score and section multiplier would have been lower, had it not been for these expeditions, great and small.

Second place among the portables was taken by W3JZY/3 in Maryland. The Copperhead V.h.f. Society made the greatest contact total of the contest, working 536 stations, including 21 on 220 Mc., for 18,381 points. Probably the highest portable was W6GCG/7, Mt. Rose, Nevada. With K6KFF assisting, W6GCG/7 worked 84 stations on 50, 144 and 220 Mc., in what may be the last contest expedition to the summit of this famous v.h.f. peak. The boys found construction underway that may prevent use of the top of the mountain in the future. Other portable stations doing outstanding work included W3OI/3, MDC, W2UPT/2, WNY, K8CKU/8, W Va., W2HBC/2, ENY, W6SDW/6, SB, and dozens of others. Their totals in the tabulation speak for themselves.

Multiple-operator work at home enabled some well-situated stations to maintain continuous operation throughout the contest, in some instances with simultaneous work on 2 or more bands. The brother act at K2ITQ, with Joe and Hal Taylor at the controls, produced an even 400 contacts on 50, 144 and 220 Mc., for 16,640 points. W2s ADE PRF and ZVW teamed up at W2ADE to work 360 stations for 11,594 points.

Use of c.w. for weak-signal scatter work paid off on 50, 144 and 220 Mc. W4HKK, Signal Mountain, Tenn., demonstrated once again the uses of ionospheric scatter, working Connecticut and Northern New Jersey by this means on a dead 50-Mc. band. Bill also got West Virginia on weak-signal c.w., the mode in this instance being

tropospheric. The 6360 at W3JZY/3, running less than 20 watts input, would never have been heard at W1HDQ if it had not been keyed. We gave them a 319 report, but it was a QSO!

A western ionospheric-scatter circuit that worked for the first time was set up between W7VMP, Phoenix, Ariz., and W7JRG, Billings, Mont. Bob, W7VMQ, reporting for W7VMP, says that this was like 144-Mc. meteor scatter, except that there was no shower going on at the time, and it was easier. Using the 30-seconds-each-way technique, a satisfactory exchange was completed easily in 20 minutes. A new section multiplier is often worth at least that much effort.

Perhaps the outstanding example of weak-signal work in the contest was the 144-Mc. QSO between W4HHK, Collierville, Tenn., and W9WOK, Barrington, Ill. This 500-mile circuit takes just about all both parties can muster in the way of power, antenna gain, receiver sensitivity and patience — but it worked, just as it has been working for several years, now.

Shown atop Mt. Kearsarge, N. H. Section, are (from left) W1RMH, W1JDF, W1AZK and W1PZA. Using the call W1BJ/1, the quartet netted leading portable score of 24,192 points.

SCORES

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; D, 420 Mc.; and E, 1215 Mc. or higher. Multiple-operator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3OLV/3 2431-143-17-AB
W3FEY...2380-119-20-AB
W3SXD...1554-111-14-AB
W3UIC...1547- 91-17-AB
W3CL...1500-100-15-AB
W3TDF...1380- 69-20-AB
W3HKZ...1235- 95-13-A
W3JXT[1]...880- 80-11-A
K3BMD/3..756- 84- 9-A
W3WJC...520- 52-10-AB
W3LDA....85- 17- 5-A
K3ATX/3...84- 28- 3-A
W3GCR/3...81- 27- 3-B
W3FMF....52- 26- 2-A
K3CHF....32- 16- 2-A
W3RHT....22- 11- 2-A
W3ARW[2] (W3s ARW PMG) 8232-172-42-ABCD
W3OI/3 (4 oprs.) 6500-260-25-AB
W3LXM/3 (4 oprs.) 4525-181-25-AB
W3TF (10 oprs.) 4212-152-27-ABC
W3HZU/3 (13 oprs.) 4092-181-22-ABC
W3DBN/3 (9 oprs.) 2698-142-19-AB
W3ZJT (4 oprs.) 2595-173-15-AB
K3BED (K3s BED DBV) 1140-114-10-A

Md.-Del.-D. C.

W3CGV...2208- 81-24-ABCD
W3LCC...2040- 90-20-ABC
W3PYW...767- 59-13-B
W3HB....228- 38- 6-B
K3BBH...210- 42- 5- -
W3TFA...198- 33- 6-AB
K3GJU....152- 38- 4-A
K3DUV....40- 20- 2-A
W3JZY/3 (14 oprs.) 18,381-536-33-ABC
K3CEZ (8 oprs.) 1498-107-14-AB

S. New Jersey

W2BLV...1140- 51-20-ABC
K2CRX....91- 13- 7-A
K2ITQ (K2s ITP ITQ) 16,640-400-40-ABC

Western New York

K2LZF...2938-226-13-A
W2UTH..2142-153-14-AB
W2LXE..1963-151-13-AB
W2SOK..1040- 95-10-ABC
W2QNA...912- 85- 8-ABC
W2RQR...396- 60- 6-ABC
W2ROA...360- 72- 5-B
KN8JLC/2[2] 328- 82- 4-B
K2IXB[1]...280- 70- 4-A
W2QMK...114- 38- 3-B
WV2BEX....80- 40- 2-B
KN8KZL/2..42- 14- 3-B
W2PZF....10- 10- 1-B
WV2AGL...28- 14- 2-B
W2MYN....22- 22- 1-B
K2VNV....15- 15- 1-A
K2PKK.....9- 9- 1-A
WV2AGM...9- 9- 1-B
K2QPC.....8- 8- 1-A
W2UPT/2[2] (6 oprs.) 8024-232-34-ABC
K2CEH/2 (4 oprs.) 3696-159-22-ABC
K2ERQ (W2s MTA YLM, K2ARO) 1781-137-13-AB
K2GMZ/2 (4 oprs.) 768- 96- 8-AB
K2CUQ (K2s CUQ DBB QPC)...405- 81- 5-A
K2GUG (K2s GUG LXC) 292- 73- 4-A

Western Pennsylvania

W3RUE...1494- 83-18-AB
W3FPH...1001- 77-13-AB
W3BWU[1]...581- 83- 7-A
W3SYU....440- 51- 8-AC
W3APR....370- 74- 5-A
W3MSR/3.287- 41- 7-B
W3ZMP....168- 24- 7-A
W3KWH (W3s FML RXT) 696- 87- 8-AB
W3TIF (4 oprs.) 364- 52- 7-A

CENTRAL DIVISION

Illinois

W9ROS[1]..2529-270- 9-AC
K9LTC....960-192- 5-A
W9EET....688- 86- 8-AB
W9OJI....558- 62- 9-B
K9DTB....468-117- 4-A
K9GUB....240- 60- 4-A
K9EEC....204- 51- 4-B
W9AGM....120- 30- 4-AB
W9WQW/9 106- 53- 2-A
W9ZKQ....99- 33- 3-A
K9JFQ....99- 33- 3-A
W9PEN....48- 24- 2-B
W9ADO....42- 21- 2-B
K9DUA....16- 8- 2-A
K9DCF....12- 4- 3-A
K9LYL.....10- 10- 1-B
W9RVG (W9RVG, K9DPV) 670-134- 5-A
K9IDA (4 oprs.) 392- 56- 7-AB

Indiana

K9PED...296- 74- 4-A
K9IXD...256- 64- 4-A
K9HYV...136- 34- 4-B

Wisconsin

W9JFP...1015-141- 7-AC
W9TQ....288- 36- 8-AB
K9JSA/9..248- 62- 4-A
W9JCI.....42- 14- 3-A
W9YT (W9SZR, K9s CJL EOP).....16- 8- 2-A

DELTA DIVISION

Tennessee

W4HHK...520- 40-13-AB
W4IKK....496- 62- 8-A
W4ZZ....108- 18- 6-AB
K4BSR....96- 24- 4-A
K4RHA/4 (2 oprs.) 584- 73- 8-A

GREAT LAKES DIVISION

Kentucky

K4BPY/4...32- 8- 4-A

Michigan

W8PFU...1752-146-12-AB
W8GTK...1740-145-12-AB
W8NOH...1275- 70-17-ABC
W8CVQ...1177-107-11-AB
K8AKQ....798-114- 7-B
KN8LHL...462- 77- 6-B
K8BGZ....360- 40- 9-AB
K8ACC[3]....300- 60- 5-A
W8VRH....246- 41- 6-B
W8QNG....110- 22- 5-A
W8VXI.....93- 31- 3-B
W8UML....90- 15- 6-A

Ohio

W8UMF[1] 1680-210- 8-A
W8MVN..1008-168- 6-A
W8BAX...580- 52-10-ABC
W8BMO...423- 46- 9-ABC
K8SY....392- 98- 4-A
W8WRN...336- 39- 8-ABCD
K8KTL....332- 83- 4-A
K8DMZ....184- 46- 4-B
W8PLQ....120- 24- 5-AB
KN8MFZ..120- 30- 4-B
W8TEX....105- 35- 3-B
KN8LFB....96- 24- 4-B
W8LKY/8[2] (6 oprs.) 2340-156-15-AB
W8SFG (W8s BTK SFG SRW)..2147-105-19-ABC
W8OSM (W8OSM, K8COT) 185- 37- 5-B

HUDSON DIVISION

Eastern New York

W2HBC/2 6372-226-27-ABCD
K2CBA[1]..3300-158-20-AC
K2YNB...2223-171-13-A
K2GCH...1944- 81-24-AB
W2MXJ...1339-103-13-B
W2SZ[4]....285- 57- 5-AB
K2QVT....171- 19- 9-A
W2TMM....63- 21- 3-AB
K2CXP/2[2] (7 oprs.) 4416-184-24-AB
K2OXU (K2s OXU YWH) 814- 74-11-A
K2YTD/2 (K2s BIO YTD) 100- 20- 5-AB

N. Y. C.-L. I.

K2VIX...4065-271-15-A
K2VDR..3220-230-14-A
W2AOC...2058- 78-21-BC
W2GLU....729- 81- 9-B
K2AZT....448- 50- 8-AC
W2AOD...416- 44- 8-BD
W2SEU....371- 53- 7-A
W2AUF....100- 20- 5- -
W2WCR[5]....56- 14- 4-B
WV2BBA/2 42- 21- 2-B
K2PHT....39- 13- 3-A
K2IEJ/2 (K2s IEJ QLC) 6206-214-29-AB

Northern New Jersey

K2MPT..2800-200-14-B
W2DZA..2626- 78-26-ABCD
W2DWJ..2047- 60-23-BCD
WV2BVC..504- 72- 7-B
W2SJU....462- 66- 7-B
K2AXQP...432- 24- 9-C
K2RPZ....125- 25- 5-A
W2CBB...120- 12-10-B
K2DIG....69- 23- 3-A
KN2LOD...66- 33- 2-B
W2VMX....1- 1- 1-A
W2ADE (W2s ADE PRF ZVW) 11,594-360-31-ABC
K2BJP (12 oprs.) 8100-206-36-ABC
W2NQW/2 (6 oprs.) 5952-248-24-AB
K2USA (8 oprs.) 4032-192-21-AB
WA2ALU/2 (multiple opr.) 2414-142-17-AB
W2HVF/2 (6 oprs.) 2365-215-11-A

MIDWEST DIVISION

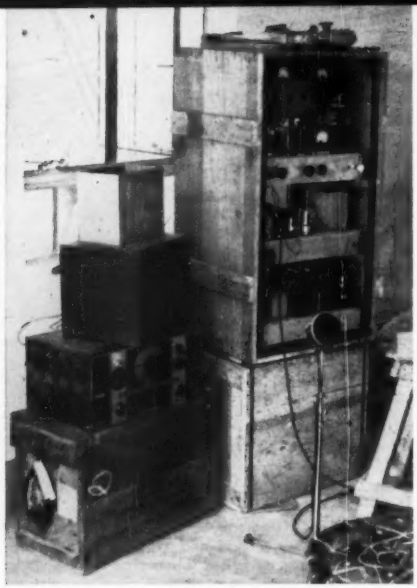
Kansas

KØITF....200- 40- 5-AB

(Continued on page 160)

VQ1 DXpedition!

BY P. B. DODD,* VQ3PBD



VQ3PBD's gear on location at VQ1PBD, suitably ventilated and boxed as called for by all good DXpeditioneers.

ZANZIBAR is a British Protectorate consisting of the two main islands of Zanzibar and Pemba together with numerous small islands situated off the east coast of Africa roughly astride 5° South Latitude. The area of the Protectorate is about 1020 square miles and the population about 264,000. The island of Zanzibar has some 375,000 acres and a population of about 150,000. It is 54 miles long by 24 miles across at the widest part, and it is a little over 20 miles across the Zanzibar Channel from the mainland. The city of Zanzibar is the capital and main port and is located on the western side of Zanzibar Island about half-way between the North and South tips of the island; the population is about 45,000 and here resides His Highness the Sultan of Zanzibar, the British Resident, the headquarters of Government, the main merchants, and so on. The harbor is a safe, good anchorage for large vessels, but only small ships can go alongside the quay. Four miles away is the airport.

The islands possess a long and varied history going back to very early days on account of the visits to East Africa from time immemorial by dhows (small wood sailing vessels up to 300 or more tons burden) from Asia in the North-East monsoon from October/November and returning northwards with the S-East monsoon in April. The East African coastal areas were settled by Arabs and Shirazis from Iraq many centuries ago and, although the Zanzibar islands at that time took a back seat to Kilwa and other places on the mainland, under the Arabs and later the Portuguese they came into their own, especially after the Sultan of Oman and Muscat moved his headquarters to Zanzibar in the early 1800s. For over a hundred years Zanzibar flourished as the all important center of the whole of Eastern Africa and from thence all the important expeditions to the interior of darkest Africa were arranged and fitted out, including those of Speke, Grant, Burton, Livingstone, Stanley, etc. In those days Zanzibar flourished on the slave and ivory trades and when the former was abolished the country slowly went back into lassitude, particularly in the face of strong and ever-growing competition by the mainland centers in country originally claimed as belonging to the Sultan but later acquired, purchased or rented by European powers.

The climate is tropical but tempered by the influence of the sea. The period December to April is hot and humid but from June to September it is cool and delightful. The products of Zanzibar are cloves (80% of the world's total), copra and various minor agricultural products.

Ever since 1879 Zanzibar has been on the cable route from Aden to Durban. Radio communications now flourish and radiotelephone links exist with the mainland as well as ordinary commercial channels to the outside world in addition to possessing a small Government broadcasting station for the local inhabitants. I cannot trace details of any amateur radio station ever being resident and one must assume there has never been one. There is nobody now, of course. There have been some half dozen short-period DXpeditions to Zanzibar since the end of World War II.

Having seven days leave in hand before going to G-land on vacation this February, our usual family arrangement would have been a quick trip in the car the 1000-odd miles to visit our folks in Kenya, but a change would do us good so we cast around for an alternative. The choice would be a DXpedition to Zanzibar and a stay with some cricketing friends of ours, if only I could talk XYL into it!! I did some talking and then some more. Also made enquiries to see what demand there might still be for VQ1 contacts. Anyway, in the end the decision was made, so I got a portable 3-element beam ready, and the second week end in October was finally chosen. Although the fares for wife, daughter and self would have been slightly cheaper by round-trip air it was decided to go both ways by ship so as to keep an eye on the gear, which, incidentally, was by no means lightweight. Steamer tickets were bought, passages booked, receiver and transmitter were packed together with a good range of spares (as practically nothing can be had over there) and finally we set off in *H.H.S. Seyyid Khalifa* (used by His Highness the Sultan

* Post Office Box 358, Dar es Salaam, Tanganyika.

of Zanzibar as his yacht but otherwise used on this run) at 10 A.M. on Sunday, October 12, in the normal splendid California (but no smog) weather we have in these parts at this time of year. The sea, as the weather boys would put it, was slight, so we enjoyed an excellent crossing with good food and the odd noggin of ale to keep the tonsils in good trim.

We arrived at Zanzibar shortly after 1 P.M. and with the usual Customs and Immigration formalities completed, we superintended the transfer of the gear from ship through sheds for carriage to mine host's house some two miles out of town. Fortunately a taxi with a sufficiently large roof rack was obtainable and with all the gear aboard this taxi and the rest of the family and our other belongings in our host's car we set off. My taxi took a round-about way to avoid the exceedingly narrow streets of the town on account of the gear stowed on the roof rack. We stopped at a woodseller's place in Ngambo en route where I bought a 21-ft. boriti (a mangrove pole) and stuck this, too, on the roof rack.

On arrival at the house the first thing we observed was that it (with other houses in the vicinity) had been built within a coconut plantation and the palms varied in height from 20 to 70 feet high so a reconnaissance was essential not only to find a fairly clear site for the beam but also to find a suitable location for the rig which would not disturb anyone at night but would be handy for me to nip out and turn the beam as required. The beam site chosen was on the front lawn, and a hole was dug in the sandy soil into which a 6 ft. pole was sunk and to which the beam boriti was tied with string! The rig was set up in the garage. I might add that Nick, my host, and his XYL Rita had never come across an amateur before but they watched my antics with great toleration and what is more gave us the most valuable assistance and support imginable. I could not have chosen a more accommodating couple and they could not have been saddled with a more unsatisfactory guest. Not only did I create untidiness everywhere and noise at all hours but from the social aspect they only saw me at meal times so they had to content themselves with 3-handed bridge up until the last night! What a guest! Anyway, the pictures illustrate the general set-up and how the beam was well surrounded by the tall palms and was also below the roof level of the double-storied house. The ground for the rig consisted of a two-foot-long ¼" iron rod hammered into the sand and well watered. Everything was finally unpacked and set up so quickly that I managed to come up on the band at 6:15 local time (GMT plus 3 hours). Fortunately the gear had suffered no damage in transit and the beam atop its 21-ft. boriti seemed fairly stable although when the wind got up next day I had to tie a lump of iron on the end of the string attached to the boom (my super-duper turning mechanism!) to keep the beam from swinging about.

The rig fired first time. A quick listen around located signals coming from the south so the beam was swung in that direction and VQ1PBD came on the air. A word perhaps about the gear which, except for the beam, is that which I use at my home QTH at VQ3PBD. The transmitter is home brewed — an 815 in the final running about 120 mils at 400 volts modulated by an 815. There are some advantages to a DXpedition being crystal controlled especially if it has a couple or 3 crystals not too far apart from each other; not only does this ensure stability in case of accidental damage, but also gives your own DX friends a fair chance of spotting your frequencies ahead of the crowd. The receiver is an ancient National NC100X with an S meter of a kind. The transmitter is also provided with an antenna tuning unit through to an aerial changeover relay. Incidentally, one day I'll finish the rig (see picture and note air conditioning!!) It was deliberately built out of parts which are readily obtainable locally (with an eye to quick replacement) and therefore can be classed very much "out of date." The beam is a 3-element job made from wood supports and ordinary aluminum curtain rail elements cut and bolted at the center for ease of transportation. I must say this little beam worked a treat especially as it was only

The beam was erected in the midst of some palm trees and was rotated by hand as the occasion demanded. Even though somewhat overshadowed by these trees, the signal was well received around the world.

21′ above ground and tilted quite a bit in some directions.

The first contact was with ZS4IF and at 1820 on October 12 and the last with ZS5OV ended at 1750 on the 16th. I had no assistant whatever during this period. Conditions were extremely variable especially during the daytime and in general could have been a lot better. Nevertheless, I worked 447 separate stations in 55 countries (including 9 on 40 meters on Monday morning for which I used a 40-meter folded dipole with each end attached to string tied to a chunk of metal thrown over coconut trees, pulled tight and fastened). To the many c.w. boys who called me I apologise — one day a c.w. expedition to Zanzibar is bound to occur the same as has happened to sideband (with VQ1ERR). 10-meter phone was used throughout except for a ½-hour chat to the locals on the mainland on 40 on the Monday morning. I did not favor any one particular country, area or direction and those who followed my QSOs for any length of time must have realized I was deliberately in a hurry only to give as many people a new country as I could in the time available. Moreover, 10 being very much in one minute and out the next during this period made it doubly essential to keep the QSOs as short as possible. Many times S9 stations told me of terrific QRM on my frequency by so many stations calling me but when I tuned after the strong station had gone, all I could hear was a tiny bleating of heterodynes from which not one single detectable word could be extracted; in fact, at times there were only two signal strength stations on the band — those which were 9 or over and those which were barely S1 — nothing in between. QSB was extremely troublesome at times. The cult of the v.f.o. made QRM very bad at times, so much so that on one or two occasions I was forced to ask stations to spread out a bit. I had some trouble with ignition but not as bad as at my home QTH, thank goodness. Ordinary static was extremely heavy to the west in the early evening and to the south for part of the morning. Luckily mains interference by vacuum cleaners etc. did not arise and on the whole the mains voltage was reasonable and no cuts. Altogether some 38½ hours was spent at the rig — during the morning and late afternoons when conditions were well below average I worked only 4 or 5 stations per hour but at night the average rose to 35 per hour.

The visit was not trouble-free by any means. On the evening of the 14th one of the power supply transformers went up in smoke and it took me an hour to transfer the loads to the other transformers in the rig. That same afternoon I could not understand why there was so little indication of modulation in the r.f. meters and discovered an anode cap connection of the 815 modulator had disconnected itself somehow. On the evening of the 15th much crackling in the receiver ended up with flames visible inside through the side louvres; having blown these out I discovered two old rubber-covered power leads had perished and shorted so replaced them, but at midnight that evening the receiver really screamed at me and awakened the household so I had to go QRT. Next morning discovered the cause to be a shorted jack-plug. The fun and games we do have!

What comments from the outside world? A station abused me because he could not copy my handle and because so many stations were hot after me I was in a hurry! Incidentally I noticed afterwards he had been a rare DX himself! A W told me he never worked 10 before and had specially bought a beam to get me; other Ws said they had taken leave off work for the day especially to try for me. One chap wanted me to test out his beam which he said was 3 feet off the deck and another spent a long time telling me I was not listed in his call book. A VE7 disliked me working on "his" frequency and a DX station was "not interested in a VQ." On two mornings an unmodulated carrier kept coming up bang on my frequencies whichever ones I switched to. However, most people realised I was in VQ1 for only a very short time and played ball really well. On my return to Dar es Salaam on Friday the 17th, I collected my mail and there was the first batch of cards to hand from as far afield even as W6.

Well, it was great fun but very tiring. A great success compared with my last trip over in 1952. I'll need a week to catch up on lost sleep and a month to catch up on the QSL situation, after having some special cards printed, etc. As elsewhere in Africa, flies were troublesome by day and mosquitoes a nuisance by night, but from the window in front I could see the crescent moon across the sea through the palm trees and from behind I could hear my XYL opening a bottle of beer when I was thirsty, so all was well!! Altogether I called CQ DX no less than 132 times, called specific stations 29 times and had no replies from 14 of them. I noticed on the W part of the band some stations called me but obviously had no clue to my frequency because I went back to them but found them calling again; perhaps they called merely because the others were doing so!! Others called and worked me twice but, being in a hurry, I was unaware of this until I entered up my index on return to Dar es Salaam. As a note of encouragement to all who have not yet got a VQ1 let me say that two other DXpeditions to VQ1 are in course of being planned — one being a joint sideband (20 meters) and a.m. (10 or 15 meters) trip by two or three separate stations from Dar es Salaam, and the other being another sideband visit by VQ4ERR. QST

ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

SPACE STATION—OR A STAR IS BORN, OR THE YASME VII

BY R. W. JOHNSON,* W6MUR

The yen for expeditioning is in all DXers' veins
That's the basis for this story, and all that it contains.
It began one early morning, before the sun was high
Sputnik two was blazing its way across the sky.
A member of the Honor Roll, scientific too
Rose in fading darkness, the satellite to view.
He braved the icy frost, glasses in his hand
To study this achievement, discussed on every band.
His receiver in the shack was tuned to frequency
Tape recorded to preserve it for all posterity.
And as he watched and listened, the great idea it came
The dream he'd always had, his biggest chance for fame.
He would operate a *mobile*, whirling 'round the earth
The risk involved, he knew, it surely would be worth.
And so the big DX man began planning his campaign
He advertised his plans from California to Spain.
Think of it, they said, a trip way out to space
Never was there anywhere such rare DX to chase!
And so the contributions were asked for from the ranks
Replying to each one received, there was a note of thanks.
Even DX editors added money to the fund
And the poorest of DX clubs eventually was dunned.
Gradually accumulated was enough to do the job
A mobile rig to outer space to satisfy the mob!

Now all details we cannot tell, security they state
But the rocket finally readied, there had arrived the date.
The radio was tested, ejection means as well
For the man inside the satellite, from it to expel.
Antennas, all hydraulic; multi-beams for every band
Power from the sun and ejection on command.
Four stages all in all, two million pounds of thrust
We could not at all afford to have this flight a bust!
The rumors flew with fervor, 'twas the talk of all the hams
Some pleaded to be first on sked, and sent in telegrams
One sent in half a bill, with a paragraph
Saying "When I get your QSL, you'll get the other half!"
And so it went for months as preparations for the flight
Brought X-day ever nearer, when the rocket would ignite.
And then all was in readiness, our DXer climbed inside.
The word went out on all the bands, all was ready for the ride!
The countdown started, broadcast, on fourteen oh five oh
As all the world sat listening beside their radio.
Nine, eight, seven, six; the seconds count began
As strapped inside, with anxious fist, sat our DX man.

And then the time had come, there was a *thunderous* roar
The rocket rose slowly first, and then began to soar
Fifteen, sixteen, seventeen thousand miles per hour
Into space it went with all its mighty power.
Then as the time was reached when the orbit could begin
All went quiet, rocket off, and rare DX within!
Antennas all unfolded, sun batteries all charged
Inflating gadgets functioned, and the capsule was enlarged
The DX man reached out and put his hand upon the key
To send the first CQ from out of gravity.
Fifty countries he became before the call was through
From Pakistan to Zanzibar, Maldive to Peru
And when he signed to listen, the din you've *never* heard
Like *that* one was all calling Satellite the Third!
From Maine to California, Finland to Japan
One hundred thousand strong they were, all calling that one man!
And he could hear them all, of course, because the ionosphere
Was far down there below him, and couldn't interfere.
Well naturally his problem was to somehow find a way
To tell one from the other, so the debt he could repay
For after all these were the ones who contributed their dough
To make this expedition for the good of radio.
With enough experience, you can always separate
The signals from each other, and QSO's accumulate.
Eighty hours later, about sixty times around,
He had twenty thousand contacts with stations still earth-bound.
Another month went by, and he had worked them all
From two hundred eighty countries, on just that single call!
And lest you think they will not count, because he's mobile way up there
The League agreed that after all, there wasn't any air
And if this be so, you couldn't say with any certainty
That he was airborne and wouldn't count, toward DXCC.

More happiness you'll never see among the DX men
Because Honor Rolls there would be never more again.
And so the time came nearer, when food and air ran low
When our DX'er thought of parting from his little moon aglow.
He made ready for ejection and strapped himself in well,
Pressed the button firmly, and down toward earth he fell.
Soon after that he landed, gently and secure
Back to earth at last, the most famous amateur.

But here is where we must relate the *saddest* tale of all
And the reason why this DX man will never dare a call
For now he's ostracized, his mind is in a fog
Up there in the satellite, he forgot and left his log!

---

*9372 Hill View Rd., Anaheim, Calif.

Previously read at the California DX clubs meeting and also at the ARRL National Convention in Washington.

Strays

Here's the way one fellow has licked the space problem. K9MIQ, who, incidentally, is 87 years old, lives in a 43-foot mobile home. You can easily see from the picture what he has in the way of equipment, all neatly contained in a plywood cabinet. He says it cost less than $15 to build this, and since he is a draftsman he will be glad to mail sketches to anyone interested in duplicating the cabinet work. (He didn't mention this, but we suggest you send a stamped, self-addressed envelope when you write him.)

Happenings of the Month

Election Results

RTTY Proposal

Examination Schedule

ELECTION RESULTS

The 1958 autumn ARRL elections have resulted in the re-election of five directors and the choosing of two new members of the Board as well as three new vice-directors for the 1959–1960 term.

John G. Doyle, W9GPI, was returned to office as director of the Central Division by 2388 votes to 1250 for Harry M. Matthews, W9UQT. **Milton E. Chaffee, W1EFW,** remains the choice of the New England Division with 1415 votes to 1218 for Ernest A. Coons, W1JLN. Roanoke Division members submitted 853 votes for their incumbent director, **P. Lanier Anderson, jr., W4MWH,** compared with 679 for B. Riley Fowler, W4RRH. **Claude M. Maer, jr., WØIC,** was returned to the Rocky Mountain directorship with a tally of 361 votes to 238 for Carl L. Smith, WØBWJ and 209 for Charles M. Butler, W5WNU. In the West Gulf Division, 1371 votes re-elected **Grady A. Payne, W5ETA,** as director, compared with 1060 for Carl C. Drumeller, W5EHC.

Morton B. Kahn, W2KR, was chosen by Hudson Division members as their director effective the first of the year. The count was 1317 votes for Kahn, 1244 for Harry J. Dannals, W2TUK, and 1067 for George V. Cooke, jr., W2OBU. Though now retired, the new director has an extensive background in the radio industry — recording engineer for Universal Pictures, service manager for RCA Photophone, eastern sales manager for Collins Radio Co., owner and president of the Transmitter Equipment Mfg. Co. and until recently a consultant for the latter firm after its sale. Formerly ORS, OPS and OO, and at one time SCM of the NYCLI section, Mort is currently a director of the SSB Amateur Radio Assn., a member of Air Force MARS, charter member of QCWA, and senior member of IRE.

EI6W, left, and W1BUD enjoy a chuckle over the Wouff Hong. The visitor, Dr. M. E. Folan, is president of the Irish Radio Transmitters Society. He was in this country under the auspices of the World Health Organization, but managed to find a ham club near every hospital on his tour!

In the Southwestern Division where the retiring director Walter Joos, W6EKM, was not a candidate, members chose **Raymond E. Meyers, W6MLZ,** as their director for the ensuing two-year term. The tally: 1054 votes for Meyers, 892 for Robert E. Hopper, W6YXU, and 666 for Howard A. Bowman, W6QIR. The new director is manager of radio operations at Lockheed Aircraft, and has an extensive communications and organizational background, including former presidencies of the North Bay Amateur Radio Club, Lockheed Employees Radio Club and Ramona Radio club, and former chairmanship of the San Francisco Council of Clubs. He is currently vice-chairman of the Los Angeles Council of Radio Clubs, president of the 50-Club of California, communications chief of San Gabriel civil defense, and vice-president of Region F, Armed Forces Communications & Electronics Assn. Ray is one of the founders of the Cooperative Interference Committee movement, an outgrowth of the TVI committee system, and presently heads the Los Angeles group.

Philip E. Haller, W9HPG, garnered 1589 votes to become the new Central Division vice-director; Ero E. Erickson, W9HPJ, got 1,152, and Charles F. Reberg, W9MVZ, 873. Long active in Chicago amateur organizational activities, Phil has several times been chairman, and secretary, of the radio club council and was also on the committees for the 1938 and 1957 ARRL National Conventions. He holds appointment as EC, OO, and assistant director. He is an electronics engineer with the Commonwealth Edison Company.

The Northwestern Division chose **Harold W. Johnston, W7PN,** as its new vice-director, giving him 882 votes to 481 for G. Dewey Wilson, W7HF. An electronics engineer in the aviation branch of the U. S. Navy, OM Johnston, formerly W7DXF, has been president of the Pendleton Amateur Radio Club and held most of the offices in the West Seattle Amateur Radio Club at one time or another. He was SCM of Oregon just before World War II, and served as director of the division in 1947–1948.

Joseph F. Abernethy, W4AKC, becomes the vice-director of the Roanoke Division, with 858

votes to 661 for Albert H. Hix, W8PQQ. Joe is director of utilities for the city of Rocky Hill, S. C., former president of the Rock Hill Amateur Radio Club, assistant director for a number of years, and RM, ORS, and OBS.

Other offices have been filled as reported in this department of November *QST*.

RTTY PROPOSAL AND FILING

In late October, just missing the copy deadline for our December issue, FCC issued a notice of proposed rule making to authorize unlicensed persons to communicate by amateur radio using radio teleprinter equipment under the control and supervision of the station licensee.

The text follows:

Before the
FEDERAL COMMUNICATIONS COMMISSION

In the Matter of

Petition for amendment of Part 12 of the Commission's Rules, Amateur Radio Service, to permit unlicensed persons to transmit by amateur radio using radio teleprinter equipment under the control and supervision of the amateur station licensee. } DOCKET No. 12648

NOTICE OF PROPOSED RULE MAKING

1. Notice is hereby given of proposed rule making in the above entitled matter.

2. The Commission has received a petition from Mr. Boyd Phelps, 4232 Scott Terrace, Minneapolis 16, Minnesota, licensee of amateur station WØBP, for amendment of Sections 12.28 and 12.136(b) to permit unlicensed persons to communicate by amateur radio using radio teleprinter equipment under the control and supervision of the station licensee. Mr. Phelps states that the Radio Amateur Teletypists Society of the Minneapolis and St. Paul area in Minnesota unanimously passed a resolution authorizing him to petition the Commission for the subject rule amendments.

3. In support of his request, petitioner cites the rule which provides for the use of radio teleprinter transmission by amateurs and also the rules which permit any person to transmit by voice over amateur stations using telephony, provided certain conditions are met. In addition, petitioner states that teleprinter provides a fast and accurate method of communication; that, in time of emergency, amateur teleprinters could handle an enormous volume of traffic into and out of a disaster area; that the number of qualified typists who could quickly learn to operate a teletypewriter may number in the millions; that, in the commercial radio teleprinter field, the persons operating the teleprinter keyboards may be, and generally are, unlicensed; and, further, that "the ability of unlicensed persons to give relief at the keyboard (for example Red Cross stenographers) could greatly help expedite distress traffic in an emergency."

4. As stated in the petition, the present rules do provide in Section 12.107, for radio teleprinter operation by amateur stations. They also provide in Section 12.28, that, ". . . When an amateur station is used for telephony, the station licensee may permit any person to transmit by voice, provided during such transmission call signs are announced as prescribed by Section 12.82 and a duly licensed amateur operator maintains actual control over the emissions, including turning the carrier on and off for each transmission and signing the station off after communication with each station has been completed."

5. Accordingly, the Commission proposes to amend Section 12.28 to provide that, when an amateur station is used for telephony or radio teleprinter transmission, the station licensee may permit any person to transmit by voice or teleprinter, provided during such transmission call signs are announced or transmitted as prescribed by Section 12.82 and a duly licensed amateur operator maintains actual control over the emissions, including turning the carrier on and off for each transmission and signing the station off after communication with each station has been completed. Section 12.136(b) would also be amended to make the changes in the rule governing logs necessitated by the above.

6. The proposed amendments of Sections 12.28 and 12.136(b) of the Commission's Rules are contained in the Appendix attached hereto and are issued pursuant to the authority contained in section 303 of the Communications Act of 1934, as amended.

7. Any interested person who is of the opinion that the proposed amendments should not be adopted or should not be adopted in the form set forth herein, may file with the Commission on or before November 28, 1958, written data, views or briefs setting forth his comments. Comments in support of the proposed amendments may also be filed on or before the same date. Comments in reply to the original comments may be filed within ten days from the last day for filing said original data, views or briefs. The Commission will consider all such comments prior to taking final action in this matter.

8. In accordance with the provisions of Section 1.54 of the Commission's Rules, an original and fourteen copies of all statements, briefs or comment filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
MARY JANE MORRIS
Secretary

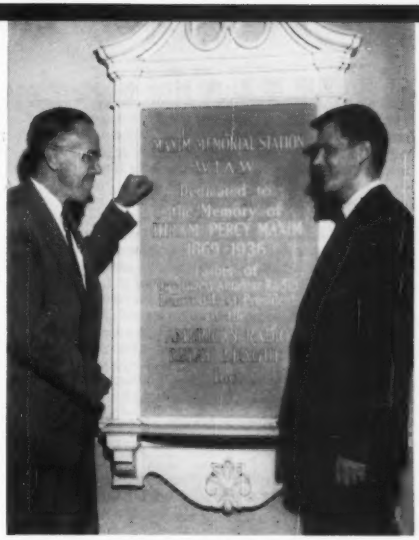
Released: October 31, 1958

APPENDIX

IT IS PROPOSED TO AMEND PART 12 OF THE COMMISSION'S RULES AS FOLLOWS:

1. *Amend Section 12.28 to read as follows:*

§ 12.28 *Who may operate an amateur station.* An amateur radio station may be operated only by a person holding a valid amateur operator license. Such station may be operated by the licensee only in the manner and to the extent provided in his amateur operator license. Persons other than the station licensee, when operating such station, may operate it only to the extent and in the manner authorized to the licensee of the station and not exceeding the operating authority of such person's own amateur operator license. When an amateur station is used for telephony or radio teleprinter transmissions the station licensee may permit any person to transmit by voice or teleprinter, provided



W1BDI shows the dedication plaque of W1AW to Osmo Wiio, OH2TK. International Liaison Officer and Editor-in-Chief of the Finnish society, Suomen *Radioamatoorilitto*, Osmo is a writer and radio announcer professionally, and was in the United States to get recorded interviews with personalities in the news.

during such transmission call signs are announced or transmitted as prescribed by § 12.82 and a duly licensed amateur operator maintains actual control over the emissions, including turning the carrier on and off for each transmission and signing the station off after communication with each station has been completed.

2. *Amend Section 12.136(b) to read as follows:*

(b) The signature of each licensed operator who manipulates the key of a radiotelegraph transmitter; the signature of each licensed operator who operates a transmitter of any other type; and the name of any person not holding an amateur operator license who either directly or by recording transmits by voice over a radiotelephone transmitter or operates a teleprinter keying a radiotelegraph transmitter. The signature of the operator need only be entered once in the log, in those cases when all transmissions are made by or under the supervision of the signatory operator, provided a statement to that effect also is entered. The signature of any other operator who operated the station shall be entered in the proper space for the operator's transmission.

Responsive to instructions of the Executive Committee, League comment has been filed indicating no objection to the proposal and endorsing the arguments submitted by petitioner as meritorious.

50-MC. F.S.K. AND 220-MC. REMOTE CONTROL

In this department of November *QST* we reported an FCC proposal to authorize radio remote control operation in our 220-Mc. band, and to permit 6F2 (essentially, audio-frequency-shift keying for radioteleprinter) emission in the 50-Mc. band. A mail vote by the Board of Directors resulted in approval of the latter item, and sympathy with the remote control proposal but a decision to ask that only half the band be made available. The text of the League filing is as follows:

FEDERAL COMMUNICATIONS COMMISSION

Amendment of sections 12.64, 12.111, and 12.231(a) of the Commission's rules so as to permit remote control of stations in the amateur and radio amateur civil emergency services when operating in the 220–225 mc. band and to permit use of 6F2 emissions by stations in these services when operating between 50.35 and 50.75 mc.	Docket 12607

Comment of The American Radio Relay League, Inc.

Pursuant to paragraph 8 of the notice of proposed rulemaking. The American Radio Relay League, Inc., files these comments on behalf of some 70,000 United States-licensed amateur radio operators who are members of the League.

1) As concerns the proposal to permit 6F2 emission in the RACES subband 50.35–50.75 Mc., the League sees no objection. Inasmuch as 6A2 emission, which may occupy substantially the same bandwidth, is already permitted in this segment, and 6F2 emission is already permitted in the 53.35–53.75 Mc. subband, it would appear that no greater interference problems would occur if the proposal is adopted.

2) As concerns the proposal to permit narrow-band frequency modulation for telegraphy in the amateur band 50–54 Mc., the League sees no objection. Inasmuch as A2 emission, which may occupy substantially the same bandwidth, is already permitted in the band, and F2 emission is already permitted in 52.5–54 Mc. with other forms of frequency modulation, it would appear that no greater interference problems would occur if the proposal is adopted.

3) As concerns the proposal to permit radio remote control in the 220–225 Mc. band, the League has no objection in principle. However, because of the nature of radio remote control operations, it may be difficult for users of these systems to insure that interference with other communications already in progress will not occur, or that no interference to the remote system will develop. Therefore, to minimize potential mutual interference between normal amateur operations and the remote control operations, the League recommends that remote control privileges should be extended only in the upper half of the band; that is, 222.5–225 Mc.

4) Except as noted in paragraph 3, the League concurs generally with the arguments advanced by petitioner in support of its proposals, and feels that the amendments proposed in this docket are constructive.

THE AMERICAN RADIO RELAY LEAGUE, INC.
BY: PAUL M. SEGAL
Its General Counsel

A. L. BUDLONG
General Manager
November 19, 1958

27 MC. IN CANADA

Canadian Director Alex Reid, VE2BE, asks us to notify all VE amateurs that the Department of Transport will continue to authorize the band 26,960–27,230 kc. for their use in accordance with the Atlantic City table of frequency allocations.

N.Z. JAMBOREE TRAFFIC

Canada and the United States have complied with a request of the administration of New Zealand and issued public notice that amateurs in each country may receive and deliver, or relay for delivery, standard text greeting messages from Boy Scouts in attendance at the Pan Pacific Jamboree to be held at Auckland January 3–10, 1959. As we reported on page 27 of October *QST*, the New Zealand Association of Radio Transmitters will operate ZL1PPJ at the site. FCC-licensed amateurs may, for the period of the Jamboree, accept and relay or deliver messages from this station destined to points within the

NOTICE

The League regrets having to announce that, because of increased costs arising particularly from substantially higher postage rates, foreign membership dues (outside Canada, the United States and possessions) are raised to $6 yearly effective January 1, 1959.

NATIONAL CONVENTION

The dates for the 11th National ARRL Convention have been set as June 19–21, 1959. The location: a recently-completed convention center in Galveston, Texas. The Galveston County Amateur Radio Club, sponsoring the affair in conjunction with the 29th annual West Gulf Division Convention, hopes that many amateurs and their families will plan to combine their vacations with attendance at the "national." *QST* will publish more information as plans develop. The committee's address is Box 73, Route 1, Galveston, Texas.

U. S. and possessions (but not to Canada or other countries). VEs may take traffic only for Canadian points. Neither Canadian nor American amateurs may originate traffic to New Zealand.

COLOR TVI PAMPHLET

The Washington (D. C.) TVI Committee has produced another in its series of excellent television interference aids, this one an initial study of possible causes, effects and cures in the matter of interference to color television reception. Originally appearing serially in *Electronic Servicing*, reprints have been provided by the Electronics Industries Association and Electronics Wholesalers. Copies are available without charge to TVI Committees or individual amateurs who provide a self-addressed stamped (8¢) envelope of standard business size (approximately 4 by 9 inches) to Harold R. Richman, Editor, WTVIC Aids, 1110 Lake Boulevard, Annandale, Virginia.

EXAMINATION SCHEDULE

THE Federal Communications Commission will give Extra and General Class amateur examinations during the first half of 1959 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified with the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: April 4 at 8:00 A.M.
Anchorage, Alaska, 53 U. S. Post office Bldg.: By appointment.
Atlanta, Georgia, 718 Atlanta National Bldg., 50 Whitehall St., S.W.: Tuesday and Friday at 8:30 A.M.
Bakersfield, Calif.: Sometime in May.
Baltimore 2, Md., 400 McCawley Bldg.: Monday and Friday, 8:30–10:00 A.M. and by appointment.
Bangor, Me.: May 13.
Beaumont, Texas, 301 P. O. Bldg.: By appointment only.
Billings, Montana: Sometime in May.
Birmingham, Ala.: March 4, June 3.
Boise, Idaho: Sometime in April.
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 10 A.M.
Buffalo, N. Y., 328 P. O. Bldg.: 1st and 3rd Fridays.
Charleston, W. Va.: Sometime in March and June.
Chicago, Ill. 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in February and May.
Cleveland, Ohio: Sometime in March and June.
Columbus, Ohio: Sometime in January and April.
Corpus Christi, Texas: March 5, June 4.
Dallas, Texas, 401 States General Life Insurance Bldg.: Tuesday.
Davenport, Iowa: Sometime in January and April.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in January, March and June.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
El Paso, Texas: June 18.
Fort Wayne, Ind.: Sometime in February and May.
Fresno, Calif.: Sometime in March and June.
Grand Rapids, Mich.: Sometime in January and April.
Hartford, Conn.: March 11.
Honolulu, T. H., 502 Federal Bldg.: Monday through Friday.
Houston, Texas, 326 U. S. Appraisers Bldg.: Tuesday and Friday.
Indianapolis, Ind.: Sometime in February and May.
Jackson, Miss.: June 3.
Jacksonville, Fla.: April 25.
Juneau, Alaska, 6 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3100 Federal Office Bldg.: Thursday and Friday, 8:30 A.M. to 1:00 P.M.
Klamath Falls, Ore.: Sometime in May.
Knoxville, Tenn.: March 18, June 17.
Little Rock, Ark.: February 4, May 6, 1:00 P.M.
Los Angeles, Calif., 849 So. Broadway: Wednesday, 9:00 A.M. and 1:00 P.M.
Louisville, Kentucky: Sometime in February and May.
Marquette, Mich.: May 13, 10 A.M.
Memphis, Tenn.: January 8, April 9.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wisc.: Sometime in January and April.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday by appointment.
Nashville, Tenn.: February 5, May 6.
New Orleans, La., 608 Federal Bldg., 600 South St.: Monday through Wednesday; code tests Monday at 8:30 A.M.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Tuesday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.
Oklahoma City, Okla.: January 14, April 15.
Omaha, Nebr.: Sometime in January and April.
Philadelphia, Pa., 1005 New U. S. Customhouse: Monday through Wednesday, code tests 8:30–10:00 A.M.
Phoenix, Ariz.: Sometime in January and April.
Pittsburgh, Pa.: Sometime in February and May.
Portland, Maine: April 14.
Portland, Ore., 507 U. S. Courthouse: Friday, 8:30 A.M.
Rapid City, S. D.: May 16, 8 A.M.
Roanoke, Va.: April 4.
St. Louis, Mo.: Sometime in February and May.
St. Paul, Minn., 208 Federal Courts Bldg.: Fri., 8:45 A.M.
Salt Lake City, Utah: March 13, June 12, 1:00 P.M.
San Antonio, Texas: February 5–6, May 7–8.
San Diego, Calif., Fox Theater Bldg.: Wednesday, by appointment.
San Francisco, Calif., 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Friday.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: March 11–12, June 10–11.
Seattle, Wash., 802 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: March 10, June 9, 10 A.M.
Spokane, Wash.: Sometime in May.
Syracuse, N. Y.: Sometime in January and April.
Tampa, Fla., 410 P. O. Bldg.: By appointment.
Tucson, Ariz.: Sometime in April.
Tulsa, Okla.: February 18, May 20.
Washington, D. C., 718 Jackson Place, N.W.: Tuesday and Friday, 8:30 A.M. to 5 P.M., Code tests 9:30 A.M. and 1 P.M.
Wichita, Kansas: Sometime in March.
Williamsport, Pa.: Sometime in March and June.
Wilmington, N. C.: June 6.
Winston-Salem, N. C.: February 7, May 2.

NOTE: Only General Class and Amateur Extra Class license examinations are given at FCC offices and examining points listed above. All examinations for Novice, Technician and Conditional Class licenses are conducted by volunteer supervisors.

FLASH!

Just as we go to press FCC has announced its decision on the League's petition[1] to set aside 100 kc. segments at the low end of the 50- and 144-Mc. amateur bands exclusively for c.w. operation. The Commission grants the exclusive c.w. segments but locates them elsewhere: effective January 10, 1959, the subbands 50.9–51.0 Mc. and 147.9–148.0 Mc. are restricted to c.w. operation. Reasons for the Commission's change of frequencies from the originally proposed rule-making are not available at press time but will be covered in the February *QST*.

[1] *QST*, August, 1958, p. 54.

Hints and Kinks For the Experimenter

ANOTHER MODIFICATION TO THE ELMAC AF67

I HAVE read with interest the modifications to the Elmac AF67 as printed in "Hints and Kinks," *QST*, October 1958. I have, however, another change which will enable the operator to read transmitter and receiver low voltage on the existing AF67 meter circuit.

As originally wired, the fourth meter position is blank. To make the modifications, connect a lead between the second and fourth terminal of SW52A (the wafer next to the panel) as shown in Fig. 1. Next, connect the lead to the fourth terminal of SW52B and feed the other end of the lead through the grommeted hole that all the switch leads pass through. Bring the lead beneath the chassis to Pin 6 of the nearest 5881 tube socket.

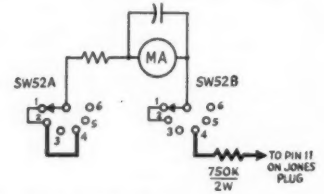


Fig. 1—Circuit modification to the meter circuit of the Elmac AF67, which allows the operator to read transmitter and receiver low voltage.

This pin is not connected electrically to the tube so it can be used as a tie point. Solder a 750,000-ohm 2-watt resistor to this same Pin 6. The other end of the resistor is soldered directly to Pin 11 of the Jones power plug. The meter switch in position 4 will now show the low voltage when the transmitter is in operation.

— *Maurice I. Sasson, M.D., W2JAJ*

COAX-FITTINGS NOTES

IT has been found that a considerable amount of energy can be lost on v.h.f. when using the 83-1SP type connector out-of-doors. The fittings are not watertight and they put a slight impedance bump in the transmission line. I have shifted all my v.h.f. connectors over to the HN-82 constant impedance type. Not only do they eliminate the bump on the transmission line but they are also watertight.

—•••—

For those who need a standard male-to-male connector, here is a way to make your own. It requires two standard male connectors (83-1SP). Cut a short piece of ½-inch copper tubing about 1½ inch long. Slide the copper tubing over one of

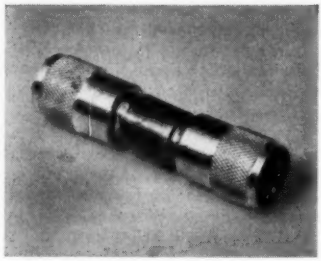


Fig. 2—Male-to-male connector made from 83-1SP coax fittings.

the fittings and then push a piece of No. 14 solid tinned wire through the two fittings from tip to tip. Push the connectors tight together with the ½-inch copper tubing centered on the two connectors. Fig. 2 shows the finished connector.

This adapter is especially convenient for connecting relays, low-pass filters, etc. directly to the 83-1R chassis connector.

— *Louis A. Gerbert, W8NOH*

LONGER LIFE FOR THE 4-H-4C BALLAST TUBE

I RECENTLY acquired a new HRO-60 receiver and after a few hours of operation the 4-H-4C ballast tube failed. This ballast tube is used in the receiver to regulate the heater voltage on the local oscillator and mixer tubes.

The manufacturer recommended that I replace the ballast tube with a 6V6 vacuum tube but this scheme provided about 13 volts on the 6V6 and practically the same on the oscillator-mixer heaters for the first few moments and then tapered off to about 7.5 volts.

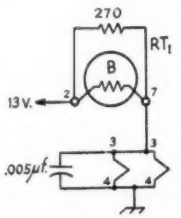


Fig. 3—Circuit showing the 270-ohm resistor across the ballast tube. The two heaters shown belong to the oscillator and mixer tubes of the HRO-60.

After experimenting with various resistors, I found that a 270-ohm ½-watt resistor provided the correct voltage when placed in parallel with the 4-H-4C. The circuit is shown in Fig. 3. The

resistor provides protection when the set is first turned on and, after the receiver has warmed up, has no appreciable effect on the heater voltage of the oscillator-mixer.

I have not had to replace a ballast tube since the above modification.

— *R. J. McCleltan, W6IOB*

TUNING WITH DIELECTRICS

WHEN the plates of a neutralizing capacitor or similar tuning device approach each other, danger of a voltage breakdown increases. The introduction of a strip of dielectric material between the fixed plates increases the capacitance without necessity for moving the plates closer together.

For example, two 1-inch square plates ¼ inch apart have a capacity in air of about 0.9 $\mu\mu$f. Introducing a polystyrene strip in the gap changes the capacitance to almost 2.5 $\mu\mu$f. A piece of plate glass shoots the capacitance up to almost 6.3 $\mu\mu$f. The dielectric may be made adjustable or may be fixed permanently once the desired capacitance is reached. Remember, however, to choose a material that has low loss at the operating frequency.

— *Frank Bronin, W4WOB*

PREVENTING WEAR ON PANEL FINISHES

AFTER several months of operating some new equipment, I noticed a shiny circle appearing on the panel behind a frequently-used control. Unwittingly, I had allowed my finger to drag on the panel as I operated the control and had worn the paint surrounding the knob.

My remedy was to drill a hole in a thin piece of clear plastic and slip it onto the panel behind the control. The plastic protects the paint but allows the lettering around the knob to be seen. It's a good idea to apply this scheme to all controls and switches that are used repeatedly.

— *Ronald Phoenix, W9HFN*

SAVE CABLE IN MAKING PARALLEL DIPOLE ANTENNAS

HINTS and Kinks" in *QST* for September 1958 carried a description of a multiband antenna using 4-conductor rotator cable. Assuming parallel dipoles are desired for 40, 20, 15 and 10 meters, most hams might purchase a length of multiconductor cable about 70 feet long and trim it equidistant from the center to the appropriate length of each dipole. However, an original length of only 45 feet, cut as shown in Fig. 4, will do the job with a saving of 25 feet of cable.

— *E. R. Hardy, W2HJL*

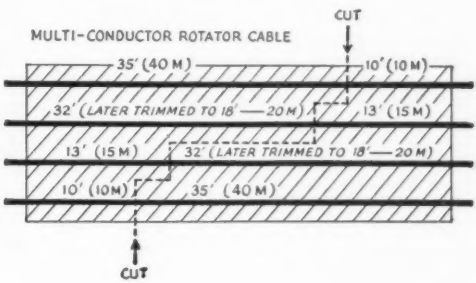


Fig. 4—W2HJL's method for saving cable when constructing a multiple dipole from four-conductor cable.

SOME NOTES ON GUYED TOWERS

Wind, Ice and Earthquake Loads

THE loads acting on a tower are essentially the same as those acting on buildings and other structures and may be placed in three main classifications: live, dead and erection. Wind is by far the most critical live load. The design wind load is usually set up from references to U. S. Weather Bureau reports and maps for each locality. It varies from a recorded 132 m.p.h. in Miami to 49 m.p.h. in Los Angeles. Velocity is converted into pounds per square feet in accordance with accepted formulas, taking into account the increase of wind velocity with height.[1] Wind tunnel tests have shown that the total wind load should be based on the projected area of 1½ tower faces on square towers. The wind on round members may be figured as two-thirds the load on flat members. Thus the load on a 3-inch rod will be equivalent to the load on a 2-inch flat bar or angle. No attempt, by the way, should be made to design a tower to resist a tornado as the chance of a direct hit is remote and there is no assurance that even a fantastically heavy structure will survive.

Ice load is another important live load. While its occurrence is not as frequent as high wind load, a heavy ice storm or freezing rain can be very disastrous to a tower. High winds seldom occur at the same time as heavy icing. On the other hand, fairly strong winds with light ice and moderate wind with heavy ice are common. Ice from ¼ inch to 2 inches thick is the usual range used for design in the continental United States. However, ice with a thickness of 12 inches or more occurs in some isolated spots. Naturally, the presence of ice on tower members increases the projected area exposed to the wind and the weight of the ice adds to the dead load.

Earthquake load must be considered in some localities, particularly on the West Coast. This load acts horizontally and is a function of the weight or mass of the structure. Although earth-

[1] Abraham, Guys for Guys Who Have to Guy, *QST*, June 1955, p. 33.

quakes occur infrequently, their threat cannot be ignored.

Erection loads are also very important, especially in the case of guyed towers. Wind on the tower in some stages of erection can subject certain members to loads greater than they will receive in fully erected condition. Loads from large and heavy gin poles add to the burden of erection loads.

Dead loads include the weight of the tower members, antenna, transmission lines, ladders and platforms.

Safety Factor

The term "safety factor" is a much misunderstood and sometimes misleading term. Generally, the term is intended to mean the number obtained by dividing the failure stress of the material by the allowable stress. A more realistic definition of the term would be a relation between the elastic limit of the material and the allowable stress. The elastic limit of the material is that stress below which the material will not take a permanent set or deformation. If a material is repeatedly loaded above the elastic limit it will fail at a load far below the failure limit. A safety factor of 2½ for a guy wire indicates that the breaking strength of the guy is 2½ times the working load.

Guys

The guyed tower depends entirely on the guys to hold it vertical and, therefore, the design of the guys is of prime importance. For a tower with one set of guys, an angle of 45 degrees to the horizontal is good practice. Tall towers with multiple guys require a steeper angle in the top guy. One anchor can then serve several guys and the angle of the lowest guy will not be too flat.

Maintenance

Towers should be inspected at regular intervals, the length of time between inspections depending on weather conditions. If the tower is located in a section of the country where windy seasons have regular cycles, inspections should regularly precede these seasons. The first step in any inspection is a check of the tower connections. Almost all towers have bolted connections with some means of locking the bolts in place. During this climbing inspection the paint should be observed for rust spots. If the tower is galvanized, the coating should be inspected.

The condition of the guys should also be checked periodically. Practically all guys are made of galvanized strand and are very durable even without additional protective treatment. However, if signs of rust appear, protective treatment is a must.

— *New England Professional Engineer*

ALUMINUM SOLDER

ANYONE who has tried to solder aluminum will appreciate the new "alloy" solder now made available by the L. B. Allen Co., Inc., 9329 Bere-

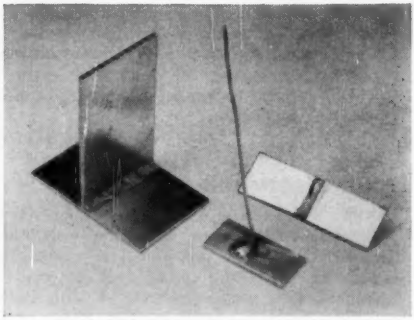


Fig. 5—Three typical uses for aluminum solder. The copper wire in the center was joined to the aluminum plate by first wetting the aluminum with the aluminum solder, then soldering with conventional lead solder.

nice Schiller Park, Ill. The solder can be obtained in bars, ⅛-inch wire, or flat strips. It will readily join aluminum and common resin core 50/50 solder will adhere to it easily.

The work to be soldered is first cleaned with a scratch brush or file. The solder is then applied to the aluminum surfaces which are heated by a soldering iron or small torch. When the solder melts, it should be rubbed thoroughly into the surface of the aluminum. This rubbing process tins the aluminum with a rough coat of solder. Once the tinning coat has been applied, the aluminum pieces may be joined by sweating them together.

For those interested, information on the development of this alloy solder for aluminum can be found in the May 1958 issue of *Bell Laboratories Record*.

— *B. L. Hinnant, W4RJ*

ILLUMINATED CALL LETTER BOX

HERE's an evening's project that will put some life in your shack and also give a few hours of enjoyable construction time. The gimmick shown in Fig. 6 is constructed in a 2¼ × 2¼ × 4-inch Minibox. The desired opening on the front panel is first scribed; four corners of the proposed cutout are drilled with a ⅜-inch bit to produce round corners and the front panel

Fig. 6—KN8MME's illuminated call letter box.

is then cut out with a small metal saw or hacksaw blade.

Letter and numeral decals, obtainable from most dime stores, are transferred to a sheet of white plastic or translucent material. This sheet is cut to fit snugly behind the opening in the front panel. When the Minibox is reassembled, it will automatically hold the plastic tight. Two felt strips are cemented inside the back section of the box to prevent light leaks.

A pilot lamp and matching socket are mounted inside the box. Power feed wires are fed through a grommeted hole in the back. Power leads can be connected to the receiver heater circuit so that the panel will be illuminated whenever the receiver is turned on. Another scheme would be to control the light with the station send-receive switch. The box would be illuminated during transmitting, giving a visual "on-the-air" indication.

— *John Howard, KN8MME*

TVI TIP

RECENTLY I had TVI and hi-fi interference complaints while operating c.w. in the 21-Mc. band. The TV set was a 21-Mc. i.f. job which had a high-pass filter installed. The filter cut the interference down considerably, but when my beam antenna was pointed directly at the set (which was over 100 feet away) interference with the sound channel was encountered. Adjustment of the TV volume control had no effect on the interference. The hi-fi interference became conspicuous when the beam was turned in the direction of the set.

I decided to tackle the problem and found that I could completely cure the trouble by connecting a resistance of 50,000 to 100,000 ohms in series with the grid of the first audio tubes. I used a 7-pin miniature test socket tube adapter (Peco TV7) and a pin adapter (Peco TVS9) and installed the resistor so as to be in series with the grid when the adapters and tubes were replaced in the set.

— *Frank J. Platner, W8FGV*

THE VIKING RANGER ON 50 MC.

Since the 11-meter band is no longer available, the 11-meter section of the Viking Ranger transmitter can be put to use on 6 meters. The Ranger v.f.o. tunes 6550 to 6865 kc. on 11 meters, giving a final output of 26.2 to 27.45 Mc. In order to use the v.f.o. for 6 meters it will be necessary to move the v.f.o. frequency down to 6250 kc. To do this, the small variable 15-$\mu\mu$f. padder C_4 (marked 11M on top of the v.f.o. compartment) is rotated near maximum capacity until it hits 6250 kc. This frequency can be checked by listening on a communications receiver at the proper frequency. The following stages of the transmitter are tuned so that the final output will be on 25 Mc. There is plenty of 25-Mc. output power available to drive an external doubler and amplifier.

For those who would like to have 6-meter output direct from the Ranger, a little more work is involved. The inductance in the grid circuit of the 6146 is too high to hit 6 meters without changing the entire switching circuit. The easiest method is to double to 50 Mc. in the plate circuit of the 6146.

There are two sets of jumpers on the 10- and 11-meter positions of switch SW_{3B} (front and rear sections). These jumpers should be unsoldered from the front and rear sections of SW_{3B}. This gives a spare contact on SW_{3B} rear which can be connected to a tap on L_{11A} for 6 meters. Fasten on a piece of No. 14 solid wire to the turn closest to the plate end of the coil near C_{37} (.002-$\mu\mu$f. capacitor). Very carefully feed this lead through the same hole that the 10-meter lead passes through and connect it to the vacant contact on SW_{3B}. Be sure to space both wires evenly and don't allow them to touch each other or come too close to the chassis.

Put the band switch in the 11-meter position and tune up just as you would for the other bands.

— *L. A. Gerbert, W8NOH*

A TIP FOR A SOLDERING TIP

To make a soldering tip that can be used in those small out-of-the-way spots that cannot be reached with standard tips, saw off the end of a standard size tip. Drill a hole large enough to take No. 9 wire down through the center of the remaining tip. Drill another hole in the side and tap for a 6-32 set screw. Insert a piece of No. 9 wire in the center, tighten the set screw and there is your new tip.

It takes a little longer to heat up the new tip and it doesn't have the heat capacity of the old one, but for hard-to-get-at spots it does the job.

— *Ralph Arsenault, VE1AK*

OBTAINING A 6ES8

Since mention of the 6ES8 dual triode in "The World Above 50 Mc.," October 1958 *QST*, I have received several inquiries as to where to buy the tube. The 6ES8 is the "super" 6BY4 with remote cut-off grids. The European equivalent is known as the ECC189, and is available from Philips in Holland. It is distributed in the United States by Amperex and probably can be obtained or ordered through local distributors.

— *John Chambers, W6NLZ*

HANDY COIL WINDER

The inner cardboard tube from bathroom tissue rolls makes a snug fit over the top of a 45 r.p.m. record player spindle and thus makes a handy method for winding coils. The speed is a convenient one and will make short job of the winding.

Multilayer or scramble-wound coils with a large number of turns may be counted approximately by using the second hand of a watch after calculating the number of turns per second. If the wire is large enough in diameter to stand the strain, tension pay be put on the wire to slow down the motor for slower and tighter winding.

— *L. E. Copleston*

YL NEWS AND VIEWS

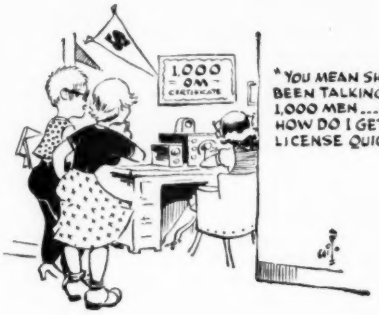
CONDUCTED BY ELEANOR WILSON,* W1QON

CONGRATULATIONS YLRL!

1959 marks the twentieth birthday of the Young Ladies Radio League. It was in May 1939 that Ethel Smith, K4LMB, then W7FWB, wrote her famous letter to the ARRL. Inquiring about the number of YL "key-twitchers," Ethel asked YLs everywhere to write to her and suggested that they might band together "in a YLRL or something." YLs throughout the country wrote to Ethel and they did unite, organizing the Young Ladies Radio League in October, 1939 and electing Ethel as the first president.

During the past twenty years the club has grown steadily in membership, activities, and prestige. Today some 850 YLs the world over support the organization and an ever-increasing number of activities. The club issues several certificates coveted by YLs and OMs alike, conducts two major contests annually, promotes net operation, sponsors conventions, and encourages affiliated club activity — to mention just a few of its projects

The *esprit de corps* among the members has always been exceptionally notable. In the club's constitution it is stated that the aim of the



YLRL is to further cooperation among members, to develop efficiency in radio operating, and to further the interests of amateur radio in general It seems evident that the YLRL is ever trying to develop these aims.

Again congratulations, YLRL, and our personal thanks for the excellent cooperation always so cheerfully extended and for the far-reaching stimulus you continuously give to YL amateur radio activity.

(A more detailed article on YLRL is planned for another issue later in the year. — *Ed.*)

*YL Editor, *QST:* Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

Helen Harris, W1HOY, of Medfield, Massachusetts, is the first YL to Work All States on 50 Mc! Long-sought contacts with Idaho and New Mexico completed Helen's WAS and gave the well-known 6-meter operator still another v.h.f. honor. Licensed in 1955, Helen enters "all v.h.f. contests" and in each has been top scorer for her section, or more often, for the entire country. She was the first YL to work Europe on six and has now worked 16 countries. She lacks only Asia for her 50 Mc. WAC. Some 6700 contacts are logged in her book, 2600 of them being with separate stations. Helen runs a kw. to a 12-element beam with four 1000A tubes. Her receiver is an NC240D with a Filter King converter. Helen's OM Sam, W1FZJ, has some interest in the higher frequencies too—he's v.h.f. editor of CQ magazine.

BPL YLs

A scan of the Brass Pounders League box in the 1958 issues of *QST* revealed some interesting YL statistics. W2KEB, W3CUL, and WØLGG made BPL in each of the twelve months and either W2KEB or W3CUL or both also placed within the top three positions each month.

Since February 1954 Georgianna Mezey, W2KEB, has made BPL monthly, usually winning first or second place on the list. Winner of the Fifth Edison Radio Amateur Award, the call of Mae Burke, W3CUL, has been heard continuously in traffic nets since 1949. Bertha Willits, WØLGG, has been a consistent BPL winner for at least three years.

Other YLs who are 1958 BPL winners are Irene Craft, WØKQD, Martha Shirley, WØZWL, Lydia Johnson, WØKJZ, Thelma Zimmerman, W9JYO, Clara Reger, W2RUF, Jeri Bey, W6QMO, Dorothy Gilbert, K2IYP, Gladys Biggs, K4LVE, and Mary Olendorff, KL7BJD. WØKQD, WØZWL, WØKJZ, W9JYO, and W2RUF have won BPL honors many times during the past several years.

The following is the first of what we hope will be an annual listing in the January column of those YLs who are BPL winners during the previous year. The number in parentheses following a call denotes 1st, 2nd, or 3rd place position in the monthly BPL listing, which appears in the

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YLs You May Have Worked

Top to bottom:

Eighteen-year-old Joan Summerfield, K6HEY, is majoring in bacteriology at the University of California, but she still finds time to pursue ham interests, including membership in the Los Angeles YLRC. Presently Joan is rebuilding her AT-1 transmitter and is planning to construct a three-element beam.

Wouldn't you be proud of your mother or grandmother if she became a ham when she was in her seventies? We would, and you can bet Frank Osier, WØGQJ, was pleased when his 75-year-young mother, Mrs. Fred Osier, became KNØPOF recently. From her Clarion, Iowa, QTH Mrs. Osier chats daily with her son in Fairfield, using a Viking Adventurer and an SX40. WØGQJ says his mother will soon be ready to take her general class exam too.

According to her OM K3EEY, Leona, K6TTT, is the "treasurer, sweetheart, and s.s.b. operator" of the Hudgins family, currently of Springfield, Pennsylvania. Bill's Navy duties necessitate frequent moves about the country, but Leona retains her W6 call. For her sideband operating K6TTT uses an Eldico 100F and 1000F with a Collins 75A-4.

Novice Marguerite Martin, KN4ZZS, tries to offer Georgia YL contacts daily on 80 and 40 c.w. The XYL of W4PFF and the mother of two young jr ops, Marguerite hopes soon to be brasspounding on 15 c.w. from the Peach State town of Dublin.

Thirty-six members of the Texas YL Round Up Net attended the net's fourth birthday party at the Blackstone Hotel in Tyler, Texas, on Nov. 8. Party Chairman was K5IMD, Betty. Seated at the table in the photo are (l. to r.): W5ERH, K5GMI, W5YKE, and W5LGY, all outgoing officers. New officers are Pres. K5BWM, V. Pres. W5JCY, Secy. K5PIO, and Pub. W5DIV. The 1959 TYLRUN Party will be at Ft. Worth with the Women Ham Operators club as hostess. *(Photo by W5FLS)*

"Traffic Topics" section. The information for any given month is for traffic handled during the month three months previous to publication.

1958 YL BPL Certificate Winners

500 or more originations plus deliveries

January.....W2KEB (2), W3CUL, WØLGG, WØKQD
February.....W2KEB (1), W3CUL, WØLGG, WØKQD, WØZWL
March.....W2KEB (1), W3CUL (3), WØLGG, WØKQD, WØZWL, W9JYO, WØKJZ, W2RUF, K4LVE, W6QMO, K2IYP
April.....W2KEB (1), W3CUL (3), WØLGG, WØZWL
May.....W3CUL (2), W2KEB (3), WØLGG, K4LVE, KL7BJD, WØZWL
June.....W2KEB (1), W3CUL, WØLGG, WØZWL, WØKQD
July.....W2KEB (1), W3CUL, WØLGG, WØKQD, WØZWL
August.....W2KEB (1), W3CUL (2), WØLGG, WØKQD
September....W2KEB (1), W3CUL (3), WØLGG
October.....W2KEB (1), W3CUL (2), WØLGG
November....W2KEB (1), W3CUL (2), WØLGG
December....W2KEB (1), W3CUL (2), WØLGG

100 or more originations plus deliveries

January.....K6OQD, WØZWL
February.....WØKJZ, W9JYO
March.....W5EGD, KN9IXD, K6OQD
April.....WØKJZ, K6OQD
May.....WØKJZ
June.....W3CUL/4, W5EGD
July.....W3CUL/4, W5EGD, KL7BJD
November....WØKQD
December....WØKJZ

HOW MANY YLs?

Take a guess at how many licensed YLs you think that there are in the United States and possessions before you read on. How many would you estimate (all classes of licenses included) — 2000? 5000? 10,000? 20,000? more? During the past several years there has been considerable speculation on the unknown quantity, but heretofore estimates have never been thoroughly substantiated.

The Young Ladies Radio League has come up with an answer which we gladly accept as being as close an approximation as any for the present. Complying with an official request made months ago by Beth Taylor, W7NJS, 1958 president of the YLRL, Membership Committee Chairmen Midge Rommell, K6BUS, and Alice Geib, W8OTK, labored through more than 400 pages of small print in the Winter 1957 *Call Book*. Names common to both male and female afforded the usual confusion, and some names seemed to lack gender entirely, making identification questionable. Midge and Alice persevered, how-

Six-meter operators all are these W1 girls who got together at the Fall luncheon of the Women Radio Operators of New England on Nov. 1 at the famous Publick House in Sturbridge, Mass. Shown in the picture are seated, l. to r. W1ZEJ, K1CUT, K1EAV, W1NJW. Standing, K1DTR, W1UKR, W1HOY, W1JHY, K1ICS, K1ICW, W1EYS. Onie Woodward, W1ZEN, presided at the luncheon, which was attended by some 60 W1 licensed YLs.

The deer learned too late that K1EKO is as adept with a rifle as she is with a c.w. key. Bagging the 160 lb. doe on the second day of the hunting season in Maine, Edith McCracken says that hunting is about the only diversion that could lure her from c.w. for more than a day. Back at her Westwood, Mass., QTH K1EKO "lives on 15 c.w." She works during the day, takes a radio course at M.I.T. three nights a week but manages to find two or three hours daily for QSOs. For 15 and 40 c.w. Edith uses an RME pre-amplifier, an SX99, Globe Sidebander, Linear, and Matcher, with a beam for 15 and a windom for 40. Finding c.w. more challenging than phone, Edith prefers 15 meters because she claims that most of the 21Mc. operators are efficient and experienced and whip along at a "stimulating" speed. Other interests shared by Edith and her OM K1GUU are "varmint" hunting, skeet and pistol shooting, and flying. (A photo of another W1 YL "deer slayer" who also has a strong preference for c.w., (W1OAK) appeared in the January, 1957, column and forces us to wonder about a possible special connection between pounding brass and shouldering a rifle!)

ever, and finished bleary-eyed but still able to make a summary statement.

There are "better than 4000" licensed YLs in the United States and possessions. Surprised? We weren't. Intuition had put our guess curiously close to that figure.

Now, there are some 180,000 hams in the United States, of which 4000 figures out to be about 2.22 per cent. So, while sometimes the feminine QRM may seem heavy, the facts reveal that we're surrounded, gals.

Thanks to the YLRL and particularly to K6BUS and W8OTK for doing a novel job which many times had been started by various individuals but to our knowledge never completed. The figure may soon be outdated — perhaps already — but at least a point of reference has been established.

YL NET RECORD

June Todd, K9CQF, wonders if the YLRL 10-meter Hair Pin Net had a record check-in of YLs into a national YL net on Oct. 28 when 51 YLs from 24 states and Hawaii called in. Nine OMs also couldn't resist the call to be logged in the net, which lasted 4 hours and 15 minutes. Meeting Tuesday at 1:00 P.M. EST the net has recently moved to 29,130 kc. NCS K6JPY is assisted by alternates K9CQF, W7DRU, and K4TGA. QST

Greetings From XE-land

BY GENERAL ALBERTO NAJERA M., XE1H

XE1H, president of the* Liga Mexicana de Radio Experimentadores, *delivered the banquet address at the Midwest Division Convention in Des Moines last October. We publish it here because we think it so eloquently expresses the basis for international friendships in amateur radio and our avocation's contributions to the social progress of the world.

Mr. Chairman, Fellow Hams and Gentlemen:

It is with a sense of the great privilege you have extended to me that I address these few words to you tonight.

The cordial invitation of your director, Robert W. Denniston, has been a high honor, both for me personally and as president of the Mexican League of Radio Amateurs. When inviting me to attend this convention of the Midwest Division of the American Radio Relay League, he asked me to bring you a message from the radio amateurs of Mexico. It therefore gives me much pleasure to tell you that before leaving Mexico City, the Board of the Mexican Radio League expressly asked me to convey to you, on their behalf and on behalf of the radio amateurs of my country, their most cordial greetings and their sincere appreciation of your gesture as a token of international friendship.

Indeed, it is such an occasion as this that brings to mind something of what we mean when we speak of "friendship" — that intangible link in human relations which has made possible our social existence since the remotest times. It is the sense of "friendship" which identifies men, draws them together and leads them to a better understanding of each other, and finally, through mutual trust and esteem, to build up that tranquility and prosperity which all men seek.

Man is essentially sociable. He needs the asso-

ARRL President Goodwin L. Dosland, W0TSN (left), exchanges official society greetings with LMRE president Alberto Najera, XE1H, at the 1958 Midwest Division Convention.

ciation of others in order to live and prosper, for his welfare and for his happiness. The unit of society as we know it is the family. Let us consider then that a nation is no more than a large family of families, and the world a family of organized nations. And, just as friendship and love unite individual man with those of his family, so these same sentiments form the bonds which strengthen human communities, be they villages, cities or nations.

In order that the expression of friendship, the supreme attainment of human relations, may be born, develop and flourish, it is necessary that men should know one another.

Friendship is only possible when we can communicate with others. A powerful instrument for doing this lies in the art and science of radio communication, and radio amateurs the world over have recognized in this a means of establishing friendship which know no bounds of race, creed or language. Indeed, we have in our hands the magic wand for attaining the ideal of peace among individuals, and peace among the people.

But to achieve our goal in human relations does not depend on communication of the spoken word alone. The development of communications in the broader sense has been the cornerstone on which the cultural and economic wealth of this great country has been built, and American contributions in the telegraph, the telephone, the automobile, the steamship, the extraordinary development of railroad and highways, the aeroplane and radio, have transformed the world we live in. These great achievements have been made available to all in the march of civilization, for the American people have shown themselves to be dedicated to the highest ideals of peace and the brotherhood of man. And so, American genius — Morse, Bell, Ford, the Wright Brothers, Edison, De Forest, to mention only a few of the great names in communications — has contributed to the dearest ideals of man in his efforts towards a better understanding between peoples.

In the art of radio communication, my country salutes the prodigious advances made by the United States and we pay tribute to the important part played by members of the American Radio Relay League. To the ARRL itself we owe a debt of gratitude for its efforts on behalf of the amateur movement and its defense of the rights of the radio amateur. And to American amateurs, to mention but one achievement, we owe the development of "short wave" communication, by means of which the distances between continents have been bridged and the remotest parts of the world have become our neighbors. We can recall with pride the participation of amateurs in scientific progress, as for example in the International Geophysical Year, and their invaluable cooperation in times of disaster and distress. It is, perhaps, opportune to mention now the expedition to Clipperton Island and to recall the part played by amateur radio when help was needed. I think I can safely say that the members of the expedition might not be with us here tonight, were it not for our extraordinary means of communication. The Clipperton Expedition also has a special and personal significance for me, inasmuch as my presence among you is closely connected with friendship made at that time and which I value very highly.

On making this visit to you, I am exchanging the visit of the distinguished members of ARRL, at the 26th Convention of the Mexican League of Radio Amateurs that took place in Mexico City last May. At this convention there were present General Manager A. L. Budlong, W1BUD, and Assistant General Manager John Huntoon, W1LVQ.

In conclusion, may I say "Thank you" for all your kindness and hospitality to me, and please accept the hearty greetings of Mexico, for all radio amateurs of the United States and of all the world, great formers of the ideal and fulfillers at the same time of the highest and purest brotherly designs.

I shall return to Mexico with most happy memories of my visit to Des Moines. Thank you.

QST

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

No doubt about it, the 6-meter band has grown up. It's a dull day that 6 isn't open for at least 8 hours, and the DX is truly worldwide in character. Such conditions breed occupancy, and the 50-Mc. band is occupied today as no v.h.f. band has ever been before. Literally thousands of stations are on there every day, and the QRM level rivals that of lower bands, even though the activity is spread out over at least two megacycles.

Business on 6 is by no means confined to the DX hours, either. On a few nights when we've come home late now and then, checks have shown a dozen or so fellows chatting merrily along on 6 at 0130 or so, just as if it were early evening, instead of early morning. Contacts are possible at any hour, and in almost any area, making the band a useful one for the daytime traveler, a condition we've seldom enjoyed in v.h.f. work heretofore.

All this occupancy was not achieved without some growing pains, however. Hams are people. Even 6-meter hams are, and they act just like people — the people they observed during their introduction to amateur radio as a hobby. The result is that 6 has, along with increased occupancy and worldwide DX, DX hogs, lids and all the ills that other bands suffer.

Time was when v.h.f. men were a race apart. V.h.f. communication was a developing art, and the hams on the frequencies above 30 Mc. were in the forefront of that development. Technically well above average, they built all or most of the equipment they used in their hamming, and we can't escape the feeling that they got more out of their results because of the effort they had to make to achieve them. Then, as now, v.h.f. operators chewed the fat for hours on end, night after night, but the tone of most of these conversations was a far cry from what one commonly hears on 6 these evenings.

But the main difference was in the operating. V.h.f. men worked as a team. Everyone did his best to help his fellows to work anything interesting or unusual that came along. Operating courtesy was universal, even when competition was keen. When you heard something good, you went after it, but you announced frequencies, passed along beam headings, and did everything you could to make the prize available to all.

It is far from that way of late. We've observed DX hog tactics on 6 that are the equal in lack of consideration (we'll be charitable and call it that!) to anything you're likely to hear in pileups on 15 or 20. Why the change? It's the fashion to blame all v.h.f. illiteracy and lid-like tendencies on the

*V.H.F. Editor, *QST*.

50 WAS Mc.

1	WØZJB	14	WØHVW	27	WØCNM	40	WØDO
2	WØBJV	15	WØWKB	28	W1VNH	41	K9DXT
3	WØCJS	16	WØSMJ	29	WØOLY	42	W6ABN
4	W5AJG	17	WØOGW	30	W7HEA	43	W6BAZ
5	W9ZHL	18	W7ERA	31	KØGQG	44	VE3AET
6	W9OCA	19	W3OJU	32	W7FFE	45	W9JFP
7	W6OB	20	W6TMI	33	WØPFP	46	WØQIN
8	WØINI	21	K6EDX	34	W6BJI	47	WØWWN
9	W1HDQ	22	W5SFW	35	W2MEU	48	K9ETD
10	W5MJD	23	WØORE	36	W1CLS	49	WØFKY
11	W2IDZ	24	W9ALU	37	W6PUZ	50	W8LPD
12	W7LLL	25	W8CMS	38	W7ILL	51	WØZTW
13	WØDZM	26	WØMVG	39	WØDDX	52	W6GCG
						53	W1SUZ

W1FOS	48	K4JMF	46	W7ACD	48	KØJJA	47
W1HOY	48	W4EQR	46	W7DYD	47	WØDGE	47
W1AEP	47	W4LNG	45	W7INX	47	WØEDM	47
W1LSN	47	W4RFR	45	W7RT	47	WØIBL	46
W1CGY	46	W4FNR	44	W7MAH	46	WØJOL	46
W1RFU	45	W4AKX	44	W7JPA	46	WØJHS	46
W1LGE	45	W4MS	44	K7AMW	45	WØOFZ	46
W1FZ	45	K4DNG	44	W7CAM	45	WØYZV	46
W1ELP	44	W4HHK	43	W7BOC	45	WØQVZ	45
W1KHL	44	K4GYZ	43	W7GRA	42	KØAKJ	45
W1IKO	44	W4ZBQ	42	W7MKW	40	WØWNU	45
W1CLH	44	K4AGM	40	W7JRG	40	KØDXS	44
W1TAM	42	K4KYL	40	W7UFB	39	KØGKR	43
						WØBTG	43
W2RGV	48	W5LFH	48	W8SSD	47	WØPKD	43
W2BYM	47	W5VY	48	W8HXT	47	KØCLJ	41
K2ITP	47	W5LFQ	47	W8WPD	47		
W2FHJ	47	W5ONS	46	W8HJR	47	VE7CN	45
K2CBA	46	W5VV	45	W8RFW	47	VE1EF	42
K2ITQ	46	W5EXZ	45	W8NOH	47	KL7AUV	41
W2SHV	45	W5FSC	45	W8SQU	46	VE7AQQ	40
K2YWH	43	W5BXA	45	W8OJN	46	VE3AIB	39
K2AXQ	43	W5KTD	44	K8CIC	46	VE2AOM	38
W2EIF	43	W5FXN	44	K8ACC	46	KN6UK	37
K2VIX	42	W5ML	44	W8ESZ	46	EI2W	36
K2LTW	42	K5ABW	42	W8NQD	45	VE3OJ	34
W2ORA	40	W5HEZ	42	W8UZ	45	VE3BHQ	33
		W5JME	42	W8INQ	43	VE3DER	33
W3TIF	47	W5CVW	42	W8EVH	42	VE1PQ	32
W3KKN	45	W5VVW	42			VE4HS	31
W3KMV	45			W9AAG	48	XE1GE	30
W3RUE	44	W6NLZ	48	W9BRN	48	SM7ZN	29
W3MXW	44	W6UXN	48	W9ZHB	48	PZ1AE	28
W3BGI	44	W6WNN	48	W9QUV	48	VE1WL	28
W3OTC	42	W6IWS	48	W9RQM	47	CO2ZX	27
W3FPH	42	W6ANN	47	W9MHP	47	ZE2JV	26
W3NKM	42	K6JCA	47	W9DSP	46	LU9MA	26
W3ZYK	42	K6GTG	47	W9EPT	46	ZS3G	26
W3LFC	41	K6HYY	47	W9JCI	45	SM6ANR	24
		W6NLZ	46	W9UIA	45	SM6BTT	23
K4DJO	47	W6JKN	46	K9EID	45	VE1ZR	23
W4UMF	47	K6KXR	46	W9SWH	44	CO6WW	21
W4AZC	47	K6RNQ	46	K9GFQ	43	LA9T	20
W4UCH	47	W6AJF	45	W9KLR	43	LA7Y	18
W4EQM	47	W6CAN	44	W9IMG	42	VQ2PL	18
W4IKK	46	W6NIT	43			JA1AUH	16
W4ZZ	46	W6BWG	43	WØAEH	47	JA8BU	14
W4CPZ	46	K6UJL	42	WØFKY	47	ZE2JV	12
W4FBH	46	K6ERG	40	WØNFM	47	JA1AAT	12
W4FLW	46			KØDTA	47		

Technician Class license, but we wonder if this is entirely justified.

If the Technician, as a newcomer, is not well informed on the finer things of v.h.f. life, whose fault is it? Who gave him his ticket? Was the teacher too concerned with just getting his pupil under the wire on the questions and the code speed? If the newly licensed ham develops into a trial to his fellows, could it just be that he was not sufficiently indoctrinated before getting the ticket?

Perhaps it would be well to remember this the next time you work with a prospect, whether he be age 16 or 60. When he gets a ticket and starts operating his own station he will be a living example of the effectiveness of your teaching. If he is the likeable and ambitious sort that most fellows are who become interested in anything as technically complex as ham radio is, even today, the chances are good that he will eventually develop into a good ham. But we can help the cause along in our work with beginners, in our radio clubs, and by the example we ourselves set by our own on-the-air methods.

If some newcomer jumps in and calls a long "CQ DX" on the frequency of a JA you're trying to hear on 6, or gets involved in a long-winded ragchew on top of some signal from a new state you're after on 2, it may be that he is not doing it intentionally. We should give him the benefit of the doubt, at least, and by our own example provide him an ideal to shoot for as he develops into a full-fledged v.h.f. man. Calling him names, meanwhile, will do no one any good.

50-Mc. DX News

For a sunspot cycle supposedly on the decline, Cycle 19 has been doing very well. It is no news to any 6-meter man that 1958 is closing in a blaze of 50-Mc. glory unparalleled in the history of v.h.f. DX. The band is open just about everywhere in the world a good part of the time, and only lack of stations in enough countries prevents 50 Mc. from being one of our prime DX bands. As is characteristic of signals near the m.u.f., the DX is often 89-plus, and even very low-powered stations work out amazingly well.

As we write at the end of November, the 50-Mc. band has been open from Eastern U. S. A. to Europe almost every day since the middle of October, and the North Atlantic m.u.f. is still rising. Transcontinental work has been a daily phenomenon for weeks, the band staying open 4 to 5 hours on the average. One of the best days yet, Nov. 23, saw W1–W6 work possible from 1030 to 1750 EST. On Nov. 25 W6s and 7s were in until 1830 EST, almost two hours after darkness fell along the Eastern seaboard.

Skip has been as short as 1800 miles, and states that were formerly workable only by patient stalking during double-hop sporadic-*E* openings have been almost routine on 6 this fall. Business in 50-Mc. WAS certificates should be booming shortly as never before. A 49-state WAS looks relatively easy, too, as the KL7s have been working over most of the country during recent afternoons. Even a 50-state WAS would be within the realm of possibility should early action on statehood for Hawaii be taken, all call areas having been worked from KH6 during November.

Japan has been worked by more American 50-Mc. stations than ever before, and over a greater area. Here are some reports on the JAs: K5CYK, Amarillo, Texas, worked JA1, 2, 3, 5 and 8 on Nov. 12, 1645 to 1835 CST. K8ACC, Richland, Mich., worked JA8AO Nov. 6, 1707 EST. W8ESZ, Grand Haven, Mich., worked him at 1725 the following day. W7RT, Seattle, worked 62 JAs Nov. 8, 1315 to 1715 PST. This after 58 contacts with East Coast stations during the morning made a fairly busy day. John reports that many JAs were coming through well with as little as 10 watts, and some were using simple dipoles and indoor antennas. The 16-element broadside array at W7RT may have helped some in this. W7JRG, Billings, Mont., worked JA7JU at 1611 MST Nov. 22, for his first Asian contact, and WAC, if he can get the cards. Ken also worked his first KL7s that day, and found back-scatter the strongest he's ever heard.

Just how far east Japanese stations have worked to date is not entirely certain, there being many reports of reception of JAs in W1, 2 and 3, some of them under highly questionable circumstances. We prefer to wait for some authentic 2-way work before crediting "heard" reports too completely, especially those that would have our Japanese friends working DX at something like 0400 their time. We

2-METER STANDINGS

Figures are states, U. S. call areas, and mileage to most distant station worked.

W1REZ	29	8	1175	W5HEZ	12	5	1250
W1AZK	24	7	1205	W5CVW	11	5	1180
W1KCS	23	7	1150	W5NDE	11	5	625
W1RFU	23	7	1120	W5VY	10	3	1200
W1AJR	22	7	1130	W5ONS	9	3	950
W1HDQ	20	6	1020	W5FEK	8	2	560
W1MMN	20	6	900				
W1IZY	19	6	875	W6NLZ	12	5	2540
W1AFO	17	6	920	W6WSQ	12	5	1390
W1ZJQ	17	6	860	W6DNG	9	5	1040
K1CRQ	17	6	800	W6AJF	6	3	800
W1CLH	17	5	450	W6ZL	5	3	1400
K1ABR	16	6	810	W6MMU	3	2	950
W1PHR	16	6	780				
W1BCN	16	5	650	W7VMP	15	5	1280
W1KHL	16	5	570	W7JRC	8	4	1040
				W7LHL	4	2	1050
W2CXY	37	8	1360	W7JIP	4	2	900
W2ORL	36	8	1250	W7JU	4	2	353
W2NLY	36	8	1390				
K2GQI	30	8	1200	W8KAY	38	8	1020
W2AZL	29	8	1050	W8WXV	35	8	1200
W2BLV	27	8	1020	W8LOF	33	8	1060
K2IEJ	25	7	1060	W8PT	33	8	985
W2AMJ	25	6	960	W8SVL	30	8	1080
W2DWJ	23	6	860	W8SFG	30	8	1060
K2HOD	23	7	950	W8LPD	29	8	850
W2PAU	23	6	753	W8EHW	28	8	860
W2SMX	22	6	940	W8WRN	28	8	680
K2CEH	21	8	910	W8BAX	27	8	960
W2LWI	21	6	700	W8DX	26	8	720
W2RXG	20	6	700	W8LC	25	8	800
W2UTH	19	7	880	W8JWV	25	8	940
W2RGV	19	6	720	W8GFN	23	8	540
W2WZR	18	7	1040	W8NOH	21	8	975
W2ESK	18	5	850	W8LCY	21	7	610
K2RLG	17	6	980	W8BLN	21	7	610
				W8GTK	18	7	550
W3RUE	30	8	975				
W3GKP	29	8	1020	W9KLR	40	9	1160
W3KCA	28	8	1110	W9WOK	40	9	1150
W3TDF	28	8	915	W9GAB	33	9	1075
W3SGA	26	7	700	W9AAG	32	8	1050
W3FPH	22	8	1000	W9REM	31	8	850
W3NKM	20	7	730	W9ZHL	30	8	830
W3LNA	20	7	720	W9LVC	27	8	950
W3LZD	20	7	650	W9EQC	26	8	820
				W9ZHL	25	8	700
W4HJQ	38	8	1150	W9BPV	25	7	1030
W4HHK	35	9	1280	K9AQP	24	7	900
W4IXL	34	8	950	W9PBP	23	8	820
W4AO	30	8	1120	W9LF	22	7	825
W4MKJ	38	8	850	W9KPS	22	7	690
W4UMF	28	8	1110	W9PMN	19	6	800
W4VLA	26	8	1000	W9ALU	18	7	800
W4EQM	25	8	1040	W9JLY	17	8	790
W4WNH	24	8	850	W9LEE	16	6	780
W4JCJ	23	6	725	W9DDG	16	6	700
K4EUS	23	6	765	W9DSP	15	6	720
W4VVE	21	6	720				
W4IKZ	20	6	720	WØSMJ	29	9	1075
W4OLK	20	6	720	WØEMQ	29	7	1110
W4AJB	19	7	840	KØHD	27	7	890
W4CPZ	18	6	650	WØBFB	27	8	1060
W4TLV	18	7	1000	WØGUD	25	7	1065
W4RFR	18	7	820	WØRUF	23	7	900
W4MDA	17	6	650	WØINI	21	6	830
K4YUX	16	8	830	WØUOP	21	7	900
W4CLV	15	5	720	WØTGC	21	7	875
W4LNG	13	5	800	WØZJB	18	7	1150
W4RMU	13	6	920	WØRYG	17	6	925
W4KCQ	10	4	860	WØIFS	16	6	1100
W4GIS	9	2	335	WØJHS	13	5	700
				WØIC	12	6	1240
W5RCI	33	9	1215	VE3DIR	28	8	1100
W5DFU	25	9	1300	VE3AIB	26	8	910
W5LPG	25	7	1000	VE3BQN	19	7	790
W5AJG	23	8	1360	VE3AQG	17	7	800
W5KTD	22	8	1200	VE3DER	16	7	820
W5JWL	21	7	1150	VE2AOK	13	5	550
W5PZ	16	8	1300	VE3BPB	14	6	715
W5VKH	15	5	720	VE7FJ	2	1	365
W5ML	15	5	700				
W5FSC	12	5	1390	KH6UK	1	2	2540

know that Japan is blessed with remarkable propagation in the 50-Mc. region, but we find it hard to believe that the band is open *that* early! We doubt that JAs find the band open much before 0630 their time, which is 1630 EST.

The Eastern record for JAs, as we write, is held by W4GJO, Sarasota, Fla. Grid had enjoyed a phenomenal day Nov. 23, what with Europe pounding in all morning and transcontinental stuff from mid-morning to early evening. A few scattered VE7s and W7s were still audible around 1720 EST, when W5s started to roll in via *Es*. Grid was working K5EBO, when a heterodyne appeared on his signal. The interference built up stronger, and a strange quality was noted on the voice. At about 1730, Grid identified the intruder as JA2GQ, calling CQ. Nedless to say, K5EBO was dropped unceremoniously, as W4GJO called and worked the JA. Contacts followed with JA1AAT, JA1BLZ and JA1BIR. JA7JU was heard in contact with VE7KN, who was also readable at this time. The JA signals were in until 1751 EST.

Late news: W4UCH, Sterling, Va., reports working JA1BIR Nov. 23. These contacts by W4GJO and W4UCH are believed to be the first work with all continents from Eastern USA.

The northeastern part of the country had the frustrating experience of hearing stations all up and down the West Coast working into Japan the night of Nov. 25. This sounded to the writer like the closest we've come to an opening to Japan from W1. W1s and 2s aiming north and slightly west of north had an auroral sort of back-scatter quality, and hearing the western end of all those transpacific QSOs made it easy to "hear" some JAs on our own. Listening to California, Oregon and Washington stations, off the backs of their beams, but still S9, working Japan — and this more than two hours after sunset — made one double-check the bandswitch position now and then to be sure he was on 50 Mc.!

W6BJI, Fresno, Cal., reports hearing JA8BY in contact with LU9MA, at 1414 PST Nov. 12. The Japan-to-Argentina path is open fairly often, despite the two countries being halfway around the world apart, but this is the first time we know of a JA being heard in this country when such work was going on. The following day W6BJI picked up ZL2DS, coming in from the direction of Japan. JA8EX had been heard a few moments before. Was this back-scatter? If so, it would appear to be a record in that department.

Back-scatter remains a little-appreciated mode of working unusual distances on 50 Mc. We used to think of it as being good for relatively short distances only, mainly because our experience with it was limited to lower frequencies, where QRM tends to blanket the weak BS signals. On 6, however, we are finding that back-scatter can be observed at practically any two points that have an F_2-layer opening to a third point common to both. Here are typical examples: KL7AUV has worked a number of VE7s and W7s by b.s. when the band is open to Japan or Hawaii. Your conductor worked XE1GE by b.s. from South America last spring, when he was the only signal audible in the band. KH6UK was heard from the northwest by K6RNQ Nov. 23.

The true potential of the b.s. mode is missed by many operators, as a result of the all-too-universal tendency to ignore very weak signals that are readable only on c.w. Using back-scatter with vigor and intelligence should pay off handsomely during the V.H.F. Sweepstakes, Jan. 10–11. For more on b.s., see this department in January, 1957, *QST*, page 53.

Countries in Europe worked two-way on 50 Mc. this fall include Eire, Norway, Sweden, Finland, Portugal and Switzerland. W1GKE and W1HOY worked HB9RG Nov. 18. W2FBA tells us that HB9BZ is on week ends, running 30 watts and a 3-element beam. He operates near the low end, ordinarily. There have been reports of OE and LX stations worked, but we have no confirmation or details.

A rare DX opening occurred in the Northwest, just to late to be reported last month. W7RT found the band open to South America, following on the heels of an opening to Florida on Oct. 25. Between 0900 and 1030 PST, John worked LU2FAO LU1FCD LU3DCA LU5ACA LU9AT and PY3BW. W7JRG, Billings, Mont., caught the same opening, working LU9AT LU3DCA LU5ACA and LU9AS, between 1045 and 1149 MST. Ken also heard PY3BW and other LUs. The band was open to somewhere in South America from the Northeast earlier that day. Your conductor heard many South American commercial signals during the morning, and worked WØDNW, North Platte, Neb., by back-scatter from the south, but apparently there were no South American amateurs on 6 in the right places until later in the day.

When you qualify for a 49-state WAS you're likely to have made it through the courtesy of these two. Jack and Margie Reich, KL7AUV and KL7BLL, Anchorage, Alaska, have been doing their best for the 6-meter fraternity.

Here's a strange observation by W7UFB, Casper, Wyo. Noting extremely strong signals from the W6s and W9s on 10 meters, the morning of Nov. 8, Bob listened on 6. He first heard W6 stations, working the East Coast, at 1025 MST. They sounded like back-scatter, but they peaked with the beam at W7UFB aimed *west*. Can anyone explain this, in view of the W6s working east at the time? Bob says it's happened before.

The West Coast circuit to Europe has been worked only rarely, but lack of success is largely a matter of unwise band usage. The same goes for East Coast to Hawaii. Less low edge crowding by rag-chewing voice operators would be a great help here. The band is open clear up to the top, boys. You don't have to hang out on 50.004 to work W1 to W6! The first European contact with the West Coast this fall was apparently the work of CT1CO, Lisbon, Portugal (50.004, c.w.), and W6NLZ, Palos Verdes, Cal., Nov. 4. This made WAC for John, the first in Southern California and No. 11 all told on 50 Mc. WØCNM, Grand Junction, Colo., got in there just before W6NLZ, and he holds No. 10.

EI2W (50.072, phone) has been working over most of North America. W5TKP, Houston, Texas, reports hearing Harry working XE1PFE Nov. 16. This is believed to be the first Mexico-Europe QSO on 50 Mc. It is of interest to note that Houston is one hop nearer Eire than is Mexico City. Grabo was also hearing VO2HA, Goose Bay, Labrador, who was in contact with Oklahoma City at this time. K5SGP, New Orleans, worked SM6BTT, Goteborg, Sweden around this time, and EI2W worked W7GRA, Benson, Ariz., both Nov. 15 and 16.

Nov. 16 was good for WØZJB, Wichita, Kan. Vince got CT1CO in the morning, and KH6NS and KH6AR in the afternoon, to complete all continents on 6. This was Vince's last day on the air from Wichita, as he had to dismantle that week end for his move to the Kansas City area. W2YYI, Geneseo, N. Y., worked KH6UK at 1608 on the 16th. The eastern end of this QSO was heard at W1HDQ by the back-scatter route, but no trace of KH6UK could be found, though we had his frequency spotted accurately.

Our day came on the 25th. Around 1400 we got a phone call from W1LGE. "KH6UK is coming through!" was all

we needed to hear to be on our way. The familiar voice was heard almost at once on the mobile setup, as we tore out of the West Hartford parking lot. The signal was gone before we got home, but some c.w. calls on the home rig brought the long-awaited response, and we worked at 1450 EST. Tommy told us that this was the second big day in a row for him, and his state total was now up to 37.

From Nov. 15 on, the m.u.f. reached record highs, pulling the skip in to the shortest ever observed on 50 Mc. via F_2-layer propagation. This was great for state hunters on both coasts who normally find it difficult to catch the states just inside the coastal strips. W2RGV, Dover, N. J., got W7BHF in Utah for No. 48. W1HOY, Medfield, Mass., caught up with K5IQL, Roswell, N. Mex., and thus became the first of her sex to work all 48 on 50 Mc. W1FOS, Wakefield, Mass., is reported under the wire, and W1SUZ came through with 48 QSLs on Nov. 24, to earn 50-Mc. Award No. 53.

The shorter skip was equally helpful for Westerners. W6ANN, San Pedro, had needed only West Virginia for about 5 years. He got it Nov. 22. W6GCG, Sunnyvale, got there first, and now holds 50-Mc. WAS No. 52. Toward the end of the month the skip was still shorter. K6RNQ worked Louisiana Nov. 24, and heard Mississippi, Arkansas and Missouri, the last being down to around 1500 miles. This must have meant an m.u.f. of 70 Mc. or higher at the peak of the opening. W6NLZ worked Mississippi and Delaware Nov. 23 for his No. 47 and 48.

Other bits and pieces: CT1CO is not the only station on 6 in Portugal. W1SUZ heard CT1ST, 50.48, automatic c.w., Nov. 11. Southern Rhodesia was worked all over the place in November. ZE1JJ, ZE2JE and XE3JJ are most frequently mentioned. We heard ZE3JJ on the mobile Nov. 14, and high-tailed for home, but arrived too late. ZS3G, Windhoek, Southwest Africa, is another African reported frequently. Likewise, CT3AE, 50.085, c.w. and phone VQ5VF is reported worked by W1FOS.

VK and ZL are rare so far. The first ZL we know of was ZL1DE, worked by K6RNQ Oct. 28, 1410 PST. K6RNQ, K6HKK and W6SUE all heard an unidentified VK5 testing (but not listening!) from 1320 to 1345 Oct. 26.

European TV signals are a great help in judging what areas are likely to be workable. See the table by W5LFM in *QST* for February, 1958. Cal heard video on 49.75 Mc. (Eastern Europe only) for the first time Nov. 15 and 16.

Orionids and Leonids Shower Results

With the accent on 50-Mc. DX recently our 144 Mc. news has all but been lost in the shuffle. It will not always be thus, however. When the solar cycle drops off a bit the 2-meter fraternity will have their innings again. Meanwhile, the real enthusiasts never stop plugging on 144 Mc., and their efforts paid off during the Orionids (Oct. 18–23) and Leonids (Nov. 14–18), both rated as major showers.

W1REZ, Fairfield, Conn., ran Orionids skeds with W5KTD, Shreveport, La., W5JWL, Gurdon, Ark., WØEMS, Omaha, Neb., WØQDH, Salina, Kan., and W5DFU, Tulsa, Okla. These were one hour each, beginning at 2200 nightly. To check various beam headings, the first 20 minutes was run with arrays on the true bearing, the second 20 minutes 20 degrees north, and the last 20 degrees south. Significant results were achieved only with W5JWL, and with him the best heading seemed to be 15 degrees north. On the other hand, WØQDH showed better results during the August Perseids. The many hours of skeds kept in this work should, by now, be showing some kind of pattern as to the optimum directions for the various showers, and whether or not we should venture past the 7-degree angle recommended by W4LTU in April, 1957, *QST*. Comments and theory along these lines will be appreciated. Best period in this series was with W5JWL, about 2330 Oct. 21, when a QSO was almost completed.

W6WSQ, West Covina, Cal., kept skeds during the Orionids with W7JRG, Billings, Mont., W7JIP, McMinnville, Ore., and WØIC, Denver, Colo. These netted a QSO with W7JRG, at 0515 PST Oct. 22, and identifications on short bursts from the other two. W2WSQ and W7JIP made it during the Leonids, between 0600 and 0630 Nov. 17. Despite high noise level, W6WSQ was able to hear signals readily, bursts being the best in his m.s. experience.

W6LIT, Loma Linda, Cal., worked W5VWU, Albuquerque, N. Mex., at 0228 Oct. 21. The exchange was completed in two bursts, the second one following after a lapse of 55 minutes. Don reports that some interest is being shown in the possibility of 220-Mc. QSOs by the MS route.

As if we didn't have little enough news on 144 Mc., we credited some work that was done on 144 Mc. to the wrong band. In reporting mobile work done by W3MSR/9 in November *QST*, page 80, we put him on 50 Mc., when he was on 144. Like WØZJB/8, reported last month, the equipment used was a Gonset III for 144 Mc., using a halo antenna. Error No. 2 in the same report: it came from W3UCR, MDC SCM, not W3UCH as stated.

V.H.F. Sweepstakes, Jan. 10–11

The major contest of the year for v.h.f. men comes up the second week-end of 1958. Rules have been modified to equalize DX opportunities. See rules in December *QST*, pages 66 and 67. All out!

220 Mc. and Up

Business is good on 220 Mc. in Southern California, according to K6GKX and K6GTG. The latter will have high power and an 88-element array in operation shortly after the first of the year, and he is interested in DX schedules on c.w. K6GTG has worked W6FZA in Porterville on c.w., using only 20 watts output and a 44-element array. This is some 160 miles, over high mountains. He has worked 85 different 220-Mc. stations since March, 1958.

K6GKX, Long Beach, reports that K6JOU made a trip down to Tijuana, Mexico, to visit XE2AF and demonstrate 220-Mc. possibilities. Operating XE2AF on 220 with 30 watts input, the following stations were worked: K6s GYF GKX JOR LXU IUJ EWS AVZ CPT HHA VRE and W6s SSB SDO MMU and WRE. Signals of XE2AF were strong and steady in the Los Angeles area.

More activity on the new 3500-Mc. band by members of the San Bernardino Microwave Society: On Nov. 16 W6SDE and W6OYJ went to the mountain cabin of W6RIS, near Crestline, in the San Bernardino Mountains, to set up on 3500 Mc. Contacts were made with the home stations of W6VIX, Ontario, 25 miles, and K6MBL, Pomona, 32 miles. K6JDJ/6 at Box Springs Mountain, near Riverside, and W6IFE/6 near Lake Elsinore, were also worked, at distances of 17 and 42 miles, respectively. The last contact is believed to be the best DX worked since the band was shifted from 3300 to 3500 Mc. Both W6SDE/6 and W6OYJ/6 worked over this path, and contacts were made between W6VIX and K6JDJ/6, and W6IFE/6 and K6JDJ/6, 21 and 23 miles, respectively.

U.h.f. and microwave gear was demonstrated at the Nov. 5 meeting of the Two Meter and Down Club of Los Angeles. K6HHA showed his converted APX receiver for 1215 Mc. The APX-6 transceiver is available as surplus in the Los Angeles area at low cost, and is expected to provide the means for many interested parties to get started in u.h.f. work. Also shown was the 21,000-Mc. transmitter built by W6MMU. Don has had this setup working for more than a year, and is hoping for other interest, as a means of setting a real DX record on that band. His transmitter has been heard well at a distance of one mile. He may have some competition from the original workers in that band. We visited W2UKL a few weeks ago and found him working with some new and better gear for the express purpose of extending the 800-foot record he established back in 1946.

Incidentally, in our records box last month we indicated that the 21,000-Mc. band had been shifted to 22,000 Mc. Not so; the change has only been proposed, not actually made.

OES Notes

W1EXZ, Danville, Vt. — Work with 50-Mc. stations in Maine over the peaks of the Presidential Range in northern New Hampshire continues. Good signals are exchanged over distances in excess of 100 miles, even with low power. Recently heard K1CNX/mobile on the Maine Turnpike. He was solidly readable for several minutes when near Litchfield, Me., and his signal was audible nearly to Augusta.

W1HDQ, Canton, Conn. — All indications show that 50-Mc. propagation is at an all-time peak. Skip is shorter and openings longer and more widely distributed than at any time in the history of v.h.f. work by amateurs. Have heard stations as near as Albuquerque, N. Mex., at peak of recent

(*Continued on page 166*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Wherefrom:

Another year! And a lollapalooza in store according to all DX indicators. . . .

You know, we rather owe it to the new blood (ham radio's enormous growth in this postwar era causes the majority of all DXers to be relatively new blood) to supply an occasional hint or two on how it all began, this DX thing. Particularly we should make it abundantly clear that the DX sphere is no johnny-come-lately to the hobby and that the long-haul spirit is as old as the game itself. Fullest appreciation of the present comes only in terms of the past, for today is essentially the sum of all yesterdays. This is true for DX as for anything else.

For such purpose let's excerpt briefly from "The ARRL — *Your* Organization," a paper prepared by past League Secretary K. B. Warner, W1EH, for presentation at the Fifth ARRL Convention in 1948[1]:

. . The difficulty in [forming a national organization of radio amateurs] was that they had no central theme on which such an organization could plan for enduring success. Then there occurred one of those small human experiences that sometimes lead to great things. Sitting at his station one evening in the early part of 1914, Mr. Maxim desired to send an amateur radiogram from Hartford to another station in Springfield, Massachusetts. His own transmitter not having sufficient range to reach Springfield, he conceived the idea of having the message relayed by an intermediate station about halfway between. This was successfully done.

Now that in itself was not particularly unusual or significant but, thinking with satisfaction of the evening's successful operating, something clicked in Mr. Maxim's mind. The problem of the national organization was solved. Here, without a doubt, was the idea around which an organization could be successfully and strongly built. . . . Within a week a suitable name had suggested itself and a month later it was decided to start the ball rolling.

It was quite an idea and that ball is still spinning. Traffic plus DX times inspirational hard work equaled ARRL. Nearly half a century has passed since those days of Wilson, the Panama Canal inaugural, basket hats and spark. Yet we find DX and traffic still fundamental angles of amateur radio; refined, individualized and complicated, to be sure, but going stronger than ever.

Your next "new one" carries an intrinsic significance far exceeding its transient value as a mere addition to a countries total. The *tradition* is immanent and vital.

—...—

Jaded? Beat? Retreat! . . .

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This from the classifieds of the *New Republic* for October 13, 1958. What to *do*, indeed!

What:

High-flying m.u.f.s, 'round-the-clock long-skip openings and a nigh-inexhaustible supply of delicious DX terminate the old year in grand DX style. Indeed, old-timer W6ZZ, whose West Coast ham career now rivals his prewar W1WV performance, is moved to pause, catch his breath and recall the words of Alice:

"You are old, Father William," the young man said,
"And your hair has become very white;
And yet you incessantly stand on your head —
Do you think, at your age, it is right?"

"In my youth," Father William replied to his son,
"I feared it might injure the brain;
But now that I'm perfectly sure I have none,
Why, I do it again and again!"

And then Miles clamps his 'phones back on, turns up the gain and chortles in his joy. Why? Well, it's like this. . . .

10 phone rolls as vanguard to this month's "How's" Bandwagon. W1s JNZ MBX OHA. W3QIR (92/70 worked/-confirmed). W4HKJ, W5KLB (184), K5HWY, W6s OJW ZZ (s.s.b.). W9s JFT WHM. K9HEA (63/21). **KØARS**, DL4YE, KP4AOO and DL4YE inform us of activity by **AP**5HQ, **CN2AX**, **CN8s** HA HU IG, **CR6s** CA O GMT, CI, **CT2AH**, **DU1AP**, **EA8CF**, ET2US, **ET3**, **FQ8AE** 22, **GC2FZC**, **GD3FOC**, **HA8WS**, **HC1AL**, **HI8GA**, **HL9KT**, **HP1s** AR GA, **HR2MT**, **HZ1AB**, **JAs** 1BF 4AH, **KAs** 2RB 7SM (28,400) 2, **KB6BH**, **KG4AY**, **KJ6BV**, **KL7SFN** (s.s.b.), **KM6BL**, **KR6CA**, **KW6s** CB CS, **KX6s** AF (700), CC CG, **LX1s** DC DE HM TJ, **M1B**, **OA4IGY**, **OE2WR**, **OQ5FH**, **PZ1AP**, **SVØWT**, **TG9AD**, **UB5FG**, **UQ2s** AN KAB 15, **UR2BU** (200) 16, **VK6RW** (400) 16, **VPs** 1EK 4LF 5BL 5ER 5RD **7NA** 9IVM, **VQs** 4DT 4FK 5PBD, VU2CQ, **YNs** 1JR 4CB, **YO3VA**, YV5DA, **ZB1USA** 16, **ZCs** "3RF" 4LL, **ZD7SA**, **ZEs** 1JN 1JV 2JE 2JH 4JH, **ZSs** 7C 8I, **4X4FF**, **9G1CH** and **9K2AZ**.

10 c.w. can't be far behind. K2UZJ declares, "Good old Ten has really blossomed out lately, often open to

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[1] Delivered posthumously for Mr. Warner by W6EY! See November 1948 *QST*, p. 33 *et seq.*

Europe in the afternoons, occasionally to Oceania in the evenings." Other reporting 28-Mc. code enthusiasts are W1s ACB MBX OHA, W2s HMJ YQN (90/76), K2UYG, K3s HWY IIX JPZ, W6OJW, W7OEB (127/102), W8s CSK KX, K9HEA, KØs ARS (102/80), DQI and VE7CE who give us the word on **CR6**CK, **CT2**AI, **CX2**BT, **EA9**AP (50), F9QV **FC**, **FA3**JR, **FF8**AJ, **HA**s 5BI 5DD (60) 16, 5DU, **HE9**LAC (73) 18, **HK3**PC (22) 20, **IT1**TAI, **JA**s 1AFF 3AA 3AB (100), 3IS 3JT 3LK (80), 7AD (68), **ØA**N, **KA2**s KS 0, LN (47) 23, **KJ6**BV, **KM6**BL, **KR6**CJ 1, **LX2**GH (50), **MP4**s BBE (40) 15, **BCK** (20), **OQ5**IG, **OX3AY** (115) 16, **SP**s 2AP 2DX 3PK, **SVØ**s WN WP WR, **TF3**AB, **UA**s 1BE 2KAW (80) 17, 3AY 3DX 3SI (100), 6KOB **9OI ØC**N **Ø**GF 23, **UB5**s KAA KAB UW, **UC2**s AX KAB 16, **UN1**s AE (93) 9-10, AN, **UQ2**AN, **VK9**DB (125) 21, **VP**s **7**BT (30) 14, **7NA 9L 9**HH, **VQ5**s EK 19, IG (20), **VR2**DG 3, **VS9**AS 13, **VU2**JA, **ZC4**s AM (65) 9, IK (80), IP (27) 12-13, **ZD**s 2GUP 2JM 7SE, **ZE**s 1JV (75) 1, 7JT, **4X4**s BX (19) 14, FN IV IX (100) and JH.

20 **c.w.** enraptures VE4DB, behooving him to comment: "He Who arranges our band conditions seems to have thrown the book away. Here in the aurora belt we usually have a session of good DX during the early fall but it normally cuts off sharply in October, and from then till March we get only the occasional day or so of fairly good DX conditions. This season we got the opening on schedule but it completely ignored the calendar and continued far into November — probably the best 20-meter conditions I have ever experienced, and I am spending my 32nd year on the band. Terrific!" Postal patter registering agreement is filed by W1s MBX RB (221/208), W2s GVZ (237/227), HMJ (275/266), JBL, K2s CJS UYG, W3s LOS (80/56), ZRQ, K3s BQB DHJ, W4s FFF HKJ, K5s HWY MHG, W6s FZH JQB KG OJW YY ZZ, K6s ALH 76/49, CQF (123/80), W7DJU, W8s CSK (123/100), KX YGR, W9s IHN JJN UBI ZYD, KØs DQI (157/136), HGB JPL, WA6CEJ, VEs 1PQ 3EIL 7CE, DL4YE, KL7PI and KP4AOO. They are good enough to take time out from splendid propagation operations to advise the readership of **AP**s 2AD 5B (11) 19-20, **BV1**s US (40) 13, USB (50) 13-14, **BY1**PK (111) and see "Whence," **CE**s **9**AK **Ø**AC, **CR6**s AI CK 22, **CR9**AH (35) 11, **CT2**BO (85) 1, **DM**s 2ADB 2ADL 3KSD 3KXH, **EA**s **6**AW **8**BF (8) 2, **8BK 8**CP, **EL1**X, **ET2**s KY (40), TO 2, US, **FA8**AN, **FB8ZZ**, **FF8**s CC (97) 5, CI, **FK8**AS, **FO8**AP (5) 4, **FU8**AE (73) 10, **FY7YF**, **GC**s 2FMV (3) 21, 3HFE (10), **HA**s 3MA 5AM 5DH 5KDQ 8KWG, **HC**s 1NA (40) 3-4, 4IM, **HK**s 3SD 3TH (10), 5SG **ØA**I (104) 30 of San Andres, **HS1**C (20) 14, **HZ1**AB, **IT1**s CDS PDN, **JT1AA**, **JZØ**s DA (30) 23, HA (10), K6IGP **KP6**, **KA**s 2YA 8KW (20) 12, **KB6**BL, **KC4**s USA USB USK USN USW, **KG**s **1**BB **1**CJ **1**DK **4**AQ **6**FAE, **KM6**s BH BL, **KR6**s BW (15) 13, DI JF USA, **KV4**s AA BO (65), **KS6**AH, **KW6**s CB CQ, **KX6**s BP BQ BT (40-80) 10, BU CW, **LA1**VC **g** (110) 8, **LUs** 1**ZE** 5**ZU**, **LZ**s 1AH 2KSL, one MD4TG, **OA4**FT, **OD5**s LB LX, **OQ5**IE, **OR4**VN, **OX3**RH (70) 6-12, **OY**s 7BS 7BY (20) 5, 7ML 8RJ, **PI1**KMA (38) 5 of Holland, **PJ2**s CB **ME**, **PYØ**NE, RAEM (20) 3 of Moscow, SM5WN **LA/p** (37) 7, **SU1**s IC 1-2, IM 2, MS (81), **SVØ**WJ, **TF3PI**, **TG9**HB, **UA1**KAE 4 of Russia's antarctic effort, **UA9**s AP CM DN (30), DR KAB KAI KEA KJF KWA, **UAØ**s CA CN 13, FF JB KAR KCO KFG KJY KOC (43) 10, KQB KZA LA LN OM RK SL, UB5s in abundance, **UC2**s AX (75), CB (65), KAB, **UD6**AM (60) 5, **UF6**BX, **UH8**KAA (33) 16, **UI8**AK, **UL7**s GL (76) 19, HB JA KAA KBK (57) 10, **UN1**s AB (4) 7, AE, **UO5**PK (35) 5, **UP2NW**, **UQ2**s AB AH AN, **UR2**s AO RET (35), VE8SI (90) at Port Radium, **VKs 9**DB (91) 8, **9**RR (56) 8-9, **ØD**A, **VP**s **18D 2GD 2SH** (35) 2-3, **2SK** (80) 3-4, **4LQ 4WI** (20) 2, **5BL 5CB 5FP 5LI 6PV 7NA** (19) 8, **8BK** (20) 23 who is LA1RC with renewed operating authorization, **8CR** (60) 22, **8DM** (13) 23, **VQs 2GW 3CF** (67) 18, **5FS**, **VRs 2DA** (100) 8, **2DK** (95) 7, **6XC**, **VSs 1JF 2JF 2UW 6EC 9AC 9AQ 9MA** (20) 13, **9MI** (41) 19 of the Maldives, **VU2**BL (26) 17, **XW8**s AH (33) 16, AI (65) 11, **YN1CAA**, **YOs** 2CD 2KAC 2KAM 3CF 3FT 3RI 8CF 8KAN, **YS1**s JM O 4, **YV5GO** (75), **ZA1**s AA MA, **ZB2Z**, **ZC4**s AM CB 23, **ZDs 1FG 7**, **2GUP** (90), **7SA** (34) 2, **9AF**, **ZEs** 3JO (18) 17, 4JZ, **ZL5**AC of the N.Z. antarctic sticks, **ZM6**AF (60) 10, **ZSs** 5RP **7** (44) 1, **9M** (20) 17, **4X4**s BX (11) 4, CK DK GY and KK.

20 **phone,** though short-skip chatter dominated the closing weeks of '58, nevertheless enabled W2HMJ, **K3BQB***, W4HKJ, W5ALA*, W6s YY ZZ*, W9YHE/* with a fast 44 sideband countries. DL4YE and VE1PQ* (66 on s.s.b.) to crack the yak barrier for **AP5HQ*** (113), **ET2US*** (315) 1, **FB8YY** (395) 7, **FU8AE**, **HC1AG*** (305) 3, **HKØAI**, **HPs** 1ME 3FL, **HS1C**, **HV1CN**, **HZ1AB***, **KA2YA***, **KB6BL***, **KC4**s USA* USB* USH* USK* USN* USW*, **KGs 1DK*** 4AA 4AQ* **6FAE*** (275) 10, **KJ6BV** (250) 11, **KM6**s BH* BI*, **KR6**s DI* QW USA*, **KX6**s BP* BT (240) 11, **OHØNC** of the Alands, **OQ5IE*** (315) 20 and Africa for your YL WAC A3, PY7SC of Fernando, **SVØWJ***, **TGØHB***, **TI2HP***, **UB5KAB*** (310) 19 pioneering sideband behind the Curtain, **UM8DX**, **VK9AD*** (315) 11 still on Norfolk, **VPs 1SD* 2AD** (177) 11, **5CB* 5ER**, **VQs 4ERR 4FF 5FS***, **VSs 2DW 5BY 9AQ**, **XW8AL**, **YN1LB*** (305) 1, **YS1JM***, **YU1AD*** (305) 19, **4X4DK*** (310) 0 and **9K2AZ** — asterisks indicating s.s.b. activity.

15 **c.w.** now combining the most optimum features of neighbors 20 and 10, presented W1MBX, W2s ETU GVZ HMJ, W3ZRQ, K3DHJ, W4s FFF JKU ZSH, K4s LAY PHY (103/72), W5KLB, K5s JPZ MHG, W6s JQB OJW, K6THZ, WA6CEJ, W7DJU, W8YGR, W9JJN, WØPXW, KØs DQI HGB JPL, DL4YE, KP4s AOO and KD with attractions like **CNs 2BK 8IH** 22, **CR6**CK, **CX2BT**, **DM2AGB**, **EAs 6AM 9AP**, **EL1X**, **ET2KY**, the 7 watts of F8WQ, **FA8TT**, **FF8**s AJ BZ, **GD3**s FBS (20) 13, HIK, **HAs** 1KSA 8CG, HB1UE FL 22, **IS1MM** 22, IT1TAI, **JAs** 1AD 1VD 2ABB 3AB 4JU (60) 0, 5AI, **KA2KS** (28), **KB6**BL 2, **KG1FR**, **KR6AK** 3, **KV4AZ** 1, **KX6**s AF BT, **LAs** 1VC/**g** of penguinland, 2JE/**p** 4PF/**p**, **LU1ZS**, **LX2**GH, **LZs** 1AH 1KNB 2KDO, **OA4BN** 5, **OD5LX**, **OQ5IG**, **PI1RRS** (50) 13, **PYØNE** (55) on Trindade, **ST2AR**, YL **SP3SQ**, **TF3**s KG PI, **UAs** 1AU 1OT 4HM 5, 4IF 6FQ **9CC 9KCA 9OI ØLA**, **UB5**s CK CL KAA KAD, **UC2KAN** (50) 15, **UO5AA**, **UP2KBC**, **UQ2**s AB AN, **UR2**s AO KAA KR, **VPs 6FR 8CR** 22, **9EB 9EE** (35) 0, **9EN 9L**, **VQs 2IE 4GQ**, **VR2**s DA DG 4, **VS9**s AP (75), AS 18, AT (77) 19, **Ws** 3ZJU **KP6** 6YYD **KJ6**, **XW8AH** (15) 15, **YOØ**RI (70) 21, **ZA1MA**, **ZC4**s BA IP (34) 18, RP 21, **4X4**s BX (15) 22, DR JM and KK 23.

15 **Novice** notes reveal that late-'58 short-skip conditions placed WAS possibilities ahead of WAC incentives. But KN1IMP, WV2BWS, KNs 6OQT and ØRKF did fine with **CT1TT** (200), **DU7SV**, **FA8RJ** (120), **JAs** 1BSO 3BP, **WH6**COK, **WL7**CRZ, **UAØAU**, **VKs** 3TX 3VJ 5LD, **VP3LS**, **ZLs** 1AIH 3US and **ZS1BB** . . . . . KN7CAD's

HL9KS and KG4AO typify a lively contribution by our forces to the DX scene. Regarding the former, W1BJI writes: "Our shack at Headquarters, U. S. Army Advisory Group, was set up at Seoul and has operated through the combined efforts of many individuals beginning in the fall of 1957." That's operator Ron Maybee in the driver's seat; he and co-operator Al Cowings currently keep the HL9KS BC-610 and three-element beam beaming around 14,140 kc. (*Photo via WsI OAK and 6ONK*) – . . . – There's rarely a dull moment in Cuba these days and operator K4CQV declares the activity of KG4AO to be a fine morale maintainer at Guantanamo Bay. The station specializes in Stateside traffic work near 14,240 kc. with its T350-XM Navy rig (600 watts to 813s), Globe King 500, two 75A-3s and a three-element rotary. Sister station KG4AA sports a similar layout at Leeward Point across the bay.

60 watts and vertical got across to **KA**9PW on 40 meters.

15 phone gives little ground in our midwinter propagation dip after its fine fall fillip. W2s HMJ KUW, W4s EGE, JKU* Z8H*, K4s DFU* PHY, W5KLB (184), W6s KG YY ZZ* (196), W9WHM, KØDQI*, DL4YE, KP4AOO and VE7CE tilted their tonsils toward **CE0Z**F of Juan Fernandez, **CN8**s GO IG JC MM* (415) 22, **HC**s 1FM 2FS, **HI8**s BE GA, **HK**s 1IH (212) 15, 3QV 7AB, **HR**2MT, **HV1**CN, **JZØ**PB, **KC4**s USB* USK* USW*, **KG**s **1**FO* **4**AD* 17, **4**AZ*, **MP4BCC** (305) 22, Alander **OHØ**NC*, **OQ5**IH, **SVØ**WE*, **TF**5WDW* (400) 17, **TG9**s HB* RY, W2ZXM/mm* of *Flying Enterprise* fame, **YN**s 1CJ (240) 3, 8OK (247) 4, **YV**2BE (210) 1, **VP**s **1**EE **1**GLG **2**MR* **2**SI* 20, 3VN **4**LF (205) 4, 5FT **6**FR 6LT 8CV 8DT, **VR2**AZ, **VU2**CQ, **ZD1**EO 0, **ZP5**s CG MQ, **ZS1**FD*, **9G1**s BA CF* 14, CH and CP, (*) meaning s.b. stuff.

40 c.w. takes finesse and cast-iron eardrums if one would DXcavate long-haul items among the mountains of low-edge rag-chewers. But it *can* be done, as W2HMJ, K3DHJ, W4FFF, K6DV, W7DJU, W9JJN, KØHGB, KP4s AOO and KD demonstrate by way of **GD**3FBS (14) 0, **HA**5KBR (31) 7, **JAs** 1AEW 1AXV 1BJH 1BNK 1BRL 1BXA 1BXS 1CJF 1EF 1YN 3ADT 3YU 7JU 8EO 9BY, **KA**9PW, **KR6**BF, **LZ**1KDP (18) 1, **OE8**KI, VKs in number, **VP**s **2**SK **7**BT (5) 2–3, **UB5**s KAM (19) 12, KKV (7) 3–4, **UO5**IT (25) 5, **UQ2**AB (30) 7, **YO7**DZ (42) 4 and **4X4**BX (13) 4–5. Most of those JAs come courtesy W7DJU whose northwest pipeline is well established. It's plain to see that 7-Mc. DX prosperity must await flimsier wee-hours potential on 20. And there's even less incentive for painstaking 3.5-Mc. work by the same token . . . . On **160** the game is shaping up at this writing. W1s BB LTW JNO, W3RGQ, W6KIP, K6HXT, W8s BBI DNU DXW EUC FHE GDQ GQP GYS MTI and VE2AIZ reached the skirmish early and flexed their lower-frequency muscles. Reports from the target areas have **DL**1FF, **G3**HKO (ex-ZB1HKO), **HC1**IM, **HB4**IM, **ZS**2s GE and KZ awaiting 1.8-Mc. openings in full readiness. Pp. 84–85, last month's column, announce details for this season's Transatlantic and World-Wide DX Tests as forwarded by W1BB. This month's week ends of concentrated 160 DX effort begin at 0500 GMT on the 4th and 18th.

Where:

Africa — FF8AC/gn, now back in France, is clearing his massive QSL backlog for extensive French Guinea and Republic of Guinea loggings. Yvon answers direct upon receipt of three IRCs (air) or two IRCs (surface mail) . . . . ET2TO writes W8KX, "The States seem to come through best here in Asmara from about 0200 local time to 0700. But these hours are not conducive to great amounts of sleep. I surely know what it's like on the W K VE end and I therefore maintain a rigid 100-per-cent QSL policy." . . . . YL K2MGE informs, "I now am QSL manager for Jane, OQ5IE, and will be happy to send cards for all her contacts with the States upon receipt of valid QSO data and self-addressed stamped envelopes." . . . . "ZD2JM asks that I advise the gang he will QSL all QSOs as soon as he gets his cards printed," advises W9WHY . . . . Richmond (Va.) Amateur Radio Club supplies QSLs for VQ1ERR's Tanganyika (VQ3ERR), Zanzibar (VQ1ERR) and future Seychelles activity with W4IYC handling matters associated therewith. "There will be delays until the logs arrive from East Africa," says Myron, "but we'll get the cards out very quickly provided the necessary s.a.s.e. and QSO details (GMT) are received." . . . . "In my mountain of mail for SU1IM I find about ninety per cent being missent to Decatur, Illinois," notes W9DRS, busy doing QSL chores for his Egyptian colleague. His particular Decatur is in Indiana.

Asia — From ZC4RP: "Please do not forward International Reply Coupons with QSLs to this station, for they are not exchangeable at this location. I QSL 100 per cent via bureaus and cards for me can be sent via RSGB, ISWL, BCM QSL, the Cyprus bureau or direct." . . . . Ex-KR6LJ-KL7AGM-W4WRL-K1CQP-KØCDF, now WA6CEJ, at Sunnymead, migrates to Greenland on the first of this month. "Much hamming to be done, c.w. only. W6UED will handle my QSLs." Nothing on Frank's KG1 call at this writing, however . . . . Former VS9O writes W6YY: "Each station I worked from the Sultanate of Oman has been QSLd through RSGB but mail from Aden to England may have gone astray." Peter now signs G3IRQ with 150 watts on 28 Mc. . . . . Take heart, laddies. "Just received a card from XW8AB for our 1955 QSO," reports KP4KD. "Two years, eleven months and twenty-three days after contact!" The relay point was Long Beach, Calif. . . . . VS2s expect to be signing a 9M2 prefix henceforth . . . . . The *DX Bulletin* of WGDXC notes that W4ANE justifiably expects s.a.s.e. cooperation with regard to his AP5HQ QSL endeavors . . . . . "VS9AQ originally was assigned the well-used call of VS9AP," observes W6YY. "But so many people mistook him for a pirate that he had it changed but quickly."

ZL3DA, activated by ZL3DX in the Chathams over September and October of last year, amassed over a thousand QSOs while transmitting single sideband exclusively. Three-quarters of Win's contacts went to Yanks using s.s.b. (43 per cent), c.w. (33 per cent) and a.m. (24 per cent). Equipment included an exciter loaned by ZL1AAX, a 6146 final running 60 watts peak, 75A-4 and dipoles. This installation was sheltered by the islands' weather station where a 230-volt diesel power plant served admirably. W6ZEN generously assists with Win's resultant QSL chores.

Oceania — FK8AS, FW8AS aspirant, tells W7SNA that IRCs are much appreciated out Noumea way. Achille wishes all QSL applicants would use 'em . . . . . W2SSC states that QSLs still due from VK0s KT and TC for 1958 Macquarie activity will go forth 100 per cent with VK2EG handling the details . . . . . "I'm back in Fiji after a pleasant vacation," notifies VR2BC. "After eight weeks in England we returned to VR2 via Las Palmas, Cape Town, Durban, Perth, Melbourne, Sydney and Wellington. As you can imagine, I found a nightmare pile-up of QSLs here! All will be answered in due course as soon as I can get down to task." Greg also was delighted to find ten new confirmed countries in that hill of mail to make a total of 130 for VR2BC . . . . . "I've asked that VR6XC logs be sent to me and, when and if they arrive, I will take care of that station's QSLs in addition to my VR6TC responsibilities." This from altruistic W4TAJ . . . . . "I leave Guam around the first of the year," advises W6IVL/KG6. "I've received many cards and have QSLd all contacts 100 per cent. But if anyone fails to receive a deserved W6IVL/KG6 card within a reasonable length of time he or she can reapply via my home address." Clayton heads for Japan and a possible KA call . . . . . Through W8ZCQ comes JZØDA's apology for tardy QSLs, the result of printing delays in Sydney . . . . . In lines to WGDXC, PA0FX renews his offer of ex-PK4DA confirmation assistance.

Europe — Via W1TUW of ARRL Hq. comes word from SM5AHK: "I'm handling QSLs for SM5WN/LA/p at Murchison Bay, Spitzbergen, who will be there till summer. There is no mail contact: logs will be transmitted by radio." . . . . W1RB and others indicate that Jan Mayen and Svalbard now join Albania, Andorra and San Marino as favorite bootlegger bait on DX bands. Spurious Franz Josef Land characterizations also abound from time to time. This type of tripe might be designated the sensationalist BL school. Another style of fakery is displayed by those who select more commonplace calls and thus rag-chew congenially without attracting the pile-up spotlight. Contrary to some belief bootlegging is as old and dishonorable as amateur radio is old and honorable. Official archives of the epochal '20s Transatlantics attest to the venerability of this lunatic fringe . . . . . Ex-DL4YE pens, "I'm quite hopeful that all who have QSLd me have received my cards. All went direct where possible. Inquiries in this regard can reach me at W9QVY." . . . . . OY7ML's QSL situation is hampered by widespread employment of an invalid address. The right one: M. Haasen, N. Finsensg. 23, Torshavn, Faeroes . . . . . W1HEZ prompts a reminder that the F2 prefix now is standard for France, F2C labels signifying Corsica . . . . . W9YSX is told by LA2TD/p that all of his Svalbard QSL debts will be paid in full this spring.

South America — "All QSLs for CE0s ZA and ZB of Juan Fernandez must be sent via the Radio Club of Chile," states CE3AG. "It is recommended to include a self-addressed envelope about 6 by 4 inches with sufficient IRCs for direct reply. Other replies will go via bureau." . . . . ZP9AY advises W7SNA that IRCs are not convertible at

FF8AC overnight found himself transformed from a fairly frilly item to a first-water DX delicacy when old French Guinea voted to become the Republic of Guinea last fall. Yvon commanded the Kankan airport, a BC-610E and HQ-140XA before recently returning to France.
(Photo via Ws 1FH, 6AM and 6YY)

his QTH — save 'em . . . . . W9WHM understands that the logs of the late Stan Ward, VP8BT-VP8BU, have not been located. The other VP8BT (Ozzie) is reachable through GM3CDL. W9WHM invites, "Anyone needing information on the location of any VP8s worked in the past year can write me and I'll try to help. S.a.s.e., please." . . . . . "For my operation at VP4WI on October 11, 12 and 21, 1958, I will answer all cards 100 per cent from my home station, W4ORB." Ironically, Don still needs VP4 himself.

Hereabouts — The days of chivalry aren't irretrievably passé. W8KX arranged an appropriate thank-you card for each station whose confirmation figured in his bid for DXCC . . . . . Now closed, KZ5BB has attempted to QSL all contacts. George still has a supply of blanks on hand and welcomes further inquiry. He points out, however, that ninety per cent of all KZ5BB cards went via bureaus. Check with your area manager first, then consult with K4AE as suggested in the following . . . . . W9YSX emphasizes the need for s.a.s.e. when applying for his FM7WU verification services . . . . . "You might advise your Novice readers who contacted KG1CK that my QSLs went to their respective bureaus within a week of QSO." Bud also discovers that some crumb has been pirating his call or using his gear without permission. Such activity obviously cannot result in KG1CK confirmations . . . . . The *m.o.* is standard at KP4AOO: "I send out cards to DX as soon as I work it but ! QSL W/Ks only upon receipt of their own." Fair enough. Incidentally, Roger is convinced that his QSLs are not getting through the CRC bureau to U stations and he wonders if this is because of the U. S. Navy plug thereon. Lastly, KP4AOO laments the vast waste of DX man-hours thanks to superfluous "PSE QSL" transmissions. DX ops almost always hold off till arrival of W/K pasteboards, anyway. Let's relegate this redundancy to the nearest repository of useless usages, eh? . . . . . Industrious W2CTN adds CR9AH, OX3RH and VK9BW to his long list of QSL-service beneficiaries. "I'm going to try to take OX3RH's log over the air because mail delivery there is a twice-per-year proposition. S.a.s.e., *please!*" . . . . . Any 1958 VP2SI activity prior to October — except for a brief session on April 24th — is assuredly spurious, according to W2KUW's information . . . . . The OX3IGY address to follow will change next month to: A. Pedersen, OZ7MA, "Hjemly," Brobyvaerk, Denmark . . . . . "W6HNX, lately VP5FH and VP7BN, has turned his logs and QSLs over to me," apprises K6VXM. VP5FH QSOs from May 2, 1956, through August 17, 1958, can be QSLd; VP7BN contacts between February 9, 1957, and August 9, 1957, likewise. All replies will go via bureaus except on s.a.s.e. requests for direct handling . . . . . The following rundown of newly available addressiana goes your way through the generosity of W1s FH TS ZDP, K1CBR, W2s CJX GVZ HMJ JBL SUC, K2UZJ, W3s LNE LOS QIR ZRQ, W4FFF, K4PHY, W5ASG, K5s GOT IIX JCC MHG, W6s AM JQB KG UL YY, W7SNA, W8s CSK IBX YGR YIN, K8GHG, W9s DRS JJN WHM WHY YSX, K9GZK, VEs 3EIL 4DB, KL7PI, CE3AG, VK3CX, Hamfesters Radio Club (Chicago), Japan DX Radio Club, Newark News Radio Club, Northern California DX Club, Ohio Valley Amateur Radio Association, Southern California DX Club, West Gulf DX Club and Wireless Institute of Australia:

AP5HQ (via W4ANE)
BV1USB, APO 140, San Francisco, Calif.
CE0s ZA ZB (via RCC)
CE0ZF (via CE2AA)
CN8IF, G. Hale (K0PIV), Kenitra, Port Lyautue, French Morocco
CR6CK, Box 24, Vila Luso, Angola
CR9AH (via W2CTN)
ex-DL4BL, A/2c C. Watson (K4ADU), 2nd AACSRON, O/L No. 3, APO 83, New York, N. Y.
ex-DL4PN-KR6PN, P. Esten (W6PN), RARET, Avenida Padre Manuel da Nobrega, 8-B, 2.° e 3.°, Lisbon, Portugal
DL4WA, A. Brogdon (W4UWA), Hq. & Svc. Co., 319th U. S. ASA Bn., APO 171, New York, N. Y.
ex-DL4YE (to W9QVY)
EA9BU (via URE)
ex-ET2RH (via W3TYW)
ET2US/ET3 (to ET2US)
ET2VB, Maj. G. C. von Bargen, USA MESCA, APO 843, New York, N. Y.
F2CB/Corsica (via REF)
FE8AP, Box 77, Yaounde, French Cameroons
ex-FF8AC/gn, Y. Rangin, Conflandey, Port/Saone, Haute Saone, France (or via REF)
FM7WU (W/Ks via W9YSX)
FQ8AE, P. O. Box 467, Brazzville, Moren-Congo, French Equatorial Africa
FW8AS (via W5GNG)
FY7YH (see FM7WU)
HC7FD, P.O. Box 5, Quito, Ecuador
HL6KEP, Box 39, Pyongyang, No. Korea
HP1SB, P.O. Box 3080, Panama City, R.P.
I1AFS (via W8KJP)
IS1ZUI, P. Mulas, via Umbria 15, Cagliari, Sardinia
KA7AX (via FEARL)
ex-KA9AR-JA2AX-JA7AX (see KA7AX)
ex-KH6BZZ/KJ6 (to K4TMY)
ex-KR6LJ (via W6UED)
KX6BU (via K6LSL)
ex-KZ5BB (via W4HYW)
LA2TD/p (to LA2TD)
MP4BBE, J. St. Leger, BAPCO, Box 76, Awali, Bahrein, Persian Gulf
OD5LB (via Ws 3TYW or 4HYW)
OQ5IE (via K2MGE, W/K/VE/VOs only)

LZ1KAB emits one of the more outstanding Bulgarian signals heard out our way. Present at the club-collective station for this album snap (l. to r.) were LZ1s AH, AB, FF, AF, UR and a KAB staffer. ***(Photo via W8KX)***

This evidence of our fifth and sixth "DXCC 2" claims (see p. 59, April 1957 QST) was filed on the same day by HB9J and W5KC. Many among the DX world's elite are represented in these collections of different-country QSLs from ARRL DXCC members. Jean and Vince equal previous DXCC 2 achievements by DL4ZC (W6KG), Ws 4LVV, 6GPB and CE3DZ. W5KC apparently has worked (121) and confirmed (115) more Century Club member-countries than any other DXer.

OR4VN-ON4VN/mm (to ON4VN via UBA)
ex-OX3IGY, A. Pedersen, OZ7MA, Rm. 419, Norre Alle 75, Copenhagen, Denmark
OX3RH (via W2CTN)
OY7BS (via OY7ML or EDR)
OY8RJ (via EDR)
OZ4FF (via OZ4IM)
ex-PK4DA (via PA0FX)
PY2BGO, M. Menezes de Oliveira, rua Catuicara 135, Caixa Postal 22, Sao Paulo, Brazil
PY7IE, C. Braga Filho, rua General Hermes 158, Maceio, Alagoas, Brazil
PY0NE (via LABRE PY1 bureau)
SV0WAE-KN4ASR SVØ, H. Cogburn, HM1, USCGC *Courier* (WAGR-410), APO 223, New York, N. Y.
TF2WDA, R. Hill, 727th AC&W Sqdn., Box 60, APO 81, New York, N. Y.
VK3ARX/LH, C. Serle, 195 Bambra Rd., Caulfield, Victoria, Australia
VK9BW (via W2CTN)
VP2KFA (via KV4AA)
VP2SK, G. Deare, P.O. Box 7, Kingstown, St. Vincent, B.W.I.
ex-VP5FH (via K6VXM)
ex-VP6US, H. Wheeler, ZB1USA, Navy 240, FPO, New York, N. Y.
ex-VP7BN (via K6VXM)
VP8BK (via LA1RC)
VP8BT, Opr. Ozzie (via GM3CDL)
VP9EB, Box 303, 1934th AACS Sqdn., APO 856, New York, N. Y.
VP9EH, R. Poultney, P.O. Box 275, Hamilton, Bermuda
VQ1ERR-VQ3ERR (via W4IYC)
VR6s TC XC (via W4TAJ)
VS1JG, 4 Wee Nam Rd., Singapore
VS6EE (via HKARTS)
W6IVL/KG6 (to W6IVL)
YJ1LC (to FU8AE)
ZB1NB (via RSGB)
ZC4RP, Cp. S. J. Butlin, No. 7 Signals Unit, c/o RAF, Nicosia, Cyprus (or see preceding text)
ZD2GUP (via RSGB)
ZD2JM, J. Macintyre, c/o P &T Hq., Kaduna, Nigeria
ZS3DP, J. G. du Plessis, P.O. Box 59, Keetmanshoop, S.W. Africa
ZS9M, E. Broome, Box 18, Francistown, Bechuanaland
3A2AF (direct or via W6TNS)
3A2CH (to W9QVY)
9G1CF/FD8 (via W2KUW)

Whence:

Europe — Stack your steins and cast your lines! DARC (Germany) invites world-wide participation in its *Fourth European (WAE) DX Contest* — this year open to c.w. only because of dwindling phone interest — to run from 2100 GMT on the 9th of this month to 2100, the 11th. Non-European stations will swap RST001, RST002, etc., serials with Europeans once per band at *one point* per contact (3.5 Mc., *two*). Additional points accrue from sending "QSO reports" (QTC) to European stations at *one point* per QTC. Each QTC consists of (1) time in GMT, (2) station call, and (3) QSO number of any previous WAE Test contact. For example, W9ABC raises DL7YZ and earns a contact point thereby; W9ABC previously worked G4GG at 1207 GMT for G4GG's 69th Test QSO. So, besides the QSO point for his serial trade with DL7YZ, another point goes to W9ABC if he sends "1207 G4GG 069" to DL7YZ. W9ABC can work DL7YZ again later on the same band but only for QTC purposes. During the 48-hour Test period each QTC can be transmitted to Europe by W9ABC but once, and DL7YZ can accept no more than ten QTC per band from W9ABC. (It figures that the more Test QSOs accumulated, the more QTC are available to parlay into additional points.) SCORING: Multiply combined QSO and QTC points collected on all bands by the combined number of *multipliers* collected on all bands, the latter deriving from DARC's Worked-All-Europe Countries List — CT1 CT2 DJ/DL/DM EA EA6 EI F FC G GC GD GI GM GW HA HB HE HV I IS IT LA LX LZ M1 OE OH OHØ OK ON OY OZ PA PX SM SP SV TF UA1–6 UB UC UN UO UP UQ UR YO YU ZA ZB1 ZB2 3A, GM Shetland, LA/p Jan Mayen, LA/p Spitzbergen, LA/p Bear Island, SV Crete, SV Rhodes, TA Europe, and UA Franz Josef Land. Special log forms for this affair are available for one IRC (for airmail, five) at DARC DX Bureau, Fuchsienweg 51, Berlin-Rudow, Germany. Entries go to the same address postmarked no later than March 19, 1959. The highest scorer in each continent and country (or call area) will earn a certificate of merit; second- and third-place awards also will be considered . . . . . In another contest this month W/Ks can only drool over the many rare Commonwealth stations which will participate in RSGB's 22nd British Empire Radio Union Test on the 17th and 18th. If a stray VQ7 shows up in this classic an international incident may be unavoidable. ZS6DL and ZC4IP ran one-two in last year's BERU event, ZS6R copping QRP honors . . . . . On 20 c.w. Ws IRB and 2HMJ humored one LA3VB/p "on Jan Mayen till summer of 1959" but NRRL files disclose nothing confirmative . . . . . OY7ML's loan of an s.s.b. rig by K6AXS terminates about now. Martin anticipated high side-band sport on 10, 15 and 20 . . . . . G3CHJ insists upon the utter logic of European-style date abbreviation: "1/12/57 naturally stands for the first day of December, 1957." . . . . . Bornholm Island's OZ4FF is 19 years young, runs 90 watts to a v.f.o.-f.d.-f.d.-p.a. outfit plus long-wire and delights in contest activities. W2SUC learns that his dad is OZ4IM . . . . . ON4VN sails homeward from Antarctica and OR4VN this month as ON4VN/mm with W6UL/mm keeping liaison . . . . . LA1VC/g is another Continental contribution to the polyglot antarctic ham family whom W6KG considers quite raisable around 14,100 kc. . . . . W3QIR finds that ZB1USA (ex-VP6US) expects removal to Sicily this month . . . . . Former DL4s on the march: DL4YE returns to W9QVY after a solid 226/178 DX spree on the Continent. DL4BL

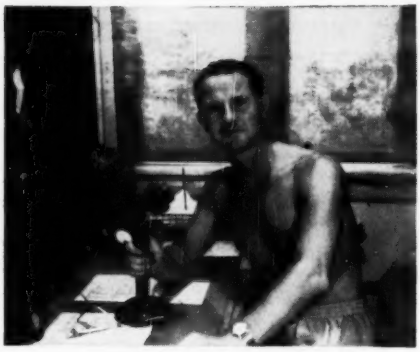
now waits his F7 suffix and hopes to DXpedite QSOs from Monaco, Luxemburg and/or Andorra with K4VYU in the next three or four months. Ex-DL4PN-KR6PN-W4PN (W6PN) is mulling over PX possibilities while situated stationless in Lisbon with forlorn hopes of winning a CT1 ticket . . . . . W4UWA, a new arrival to Germany, drew the tag DL4WA and quickly soldered a bunch of orange juice cans together for a two-band vertical to go with his 400-watter. [Orange juice cans? Boss, *what* are the forces coming to? — *Jeeves*] . . . . . W9JJN translates the flip side of his Sputnik-reception QSL to this effect: "To the participant in the observation of the world's first soviet artificial earth satellite. . . . We thank you for the notices sent. Your observations represent scientific value and are used by us in the work-up of data in conjunction with the International Geophysical Year. We hope to continue to receive your reports in the future. — *U.S.S.R. Committee for IGY*." . . . . . WGDXC's organ tells of W1TYQ's hopes for an HV1CN operational encore this spring or summer.

South America — Our DXtravaganza of the Month, if all goes swell, should be Radio Club of Chile's invasion of Juan Fernandez. The plan of battle calls for CE3AG to sign CEØZA with s.s.b. on 14,310 and 21,410 kc., c.w. near 14,030, 21,030 and 28,030 kc., while CE3s DY GI and HL busy themselves with CEØZB on a.m. around 14,100, 21,200 or 28,200 kc. Gear will include a 32S-1 and 75S-1. CE3AG cautions, "Transportation means are scarce and irregular so we cannot fix an exact date. But we pray that our plans will not fail." Meanwhile, down on the ranch, advance J.F. activity is produced by CEØZF (erstwhile CE2BM) whose erratic modulation and scant English were sampled by Ws 5ASG and 6YY on 20 and 15 meters . . . . . W9WHM recommends VP8IDT for your South Orkneys 15-meter phone pleasure each Sunday evening . . . . . W4ORB guest-operated VP4WI for thirteen c.w. hours on 14 Mc. in mid-October, scoring a fast 45 countries. "I also visited LABRE's PY7 headquarters at Recife and received a fine welcome." . . . . . Ex-HK3AB, since swapping Bogota surroundings for the less congested Bucaramanga bailiwick, has pushed HK7AB's DX tally to a sumptious 189-165, this on 10 phone for the most part . . . . . PY4ZG tells W2GVZ that DXpeditioning PY1HQ of Trindade's PYØNE party prematurely returned to Rio because of family illness. PY1CK took over c.w. duties to keep this show on the road . . . . . "This station will be closing down on approximately the first of January," warns KC4USA operator Whit . . . . . W3LNE affirms that FM7WU and FY7YH are one and the same feller.

Asia — With ham activity in Red China a curious cipher W6YY and others raised eyebrows at the 20-c.w. emissions of BY1PK, Peiping. This crystal-controlled job restricted its communications to the Curtain realm, radiating from the scene of high-speed c.w. competitions which were attended by such folk as DM3KMN and LZ1KBD staffers Franz and Marga . . . . . W6YY reports a fast 35-watt DX rise to 76 countries at VS9AQ. Neighbor VS9AC toted an 8-watt portable into the Sultanate of Oman for a few days of autumn operation and succeeded in raising four W4/K4s . . . . . Speaking of the Sultanate, ex-VS9O writes W6YY from G3IRQ: "I did not have a license in the S. of O. as no one could give me one; no post office, and the Sultan did not understand amateur radio. I was doing fine on 21-Mc. phone when I was advised to pack it up right quick or find myself in the local gaol." Hmmm — there ought to be better ways to ingratiate uninitiated governmental authorities reference ham radio, gang. Diplomacy, in the long run, would seem to be the best policy. Ex-HL2AM-W7PCZ suggests, "Take time to fully coordinate and follow through if your objective is to put a 'rare one' on the air. By all means respect foreign customs and tradition and be of service to those who may not early realize the unbounding benefits which accrue from participation in the well-administered international hobby of amateur radio." . . . . . WØWXJ, ensconced in Korea without hamming authorization, writes, "Only three HL9 calls have been issued to American parties, and ten HL2 calls to nationals. No luck on my part as yet." . . . . . OD5LB was operated by W3TYW, K3CJN and KL7AGA (ex-ET2RH) for 24 intermittent hours between October 18 and 21, 1958. "We could use the equipment only during the night when the jeep in which it was mounted was not in use. Operation was on 20 and 15, phone and c.w., and we scored 192 contacts, 74 on voice. We managed to work 33 countries on five continents plus about twenty States. This trip came up very suddenly and we were unable to get any other equipment together to take along. I must compliment most of the W/K gang on good operating procedures. Some notable exceptions will remain anonymous and, so far as I know, are still calling OD5LB. The European standard of operating also was good with the DL and UA boys far and away the best." . . . . . W7DJU claims the first Shizuoka-A-1 sheepskin (p. 69, November 1958 *QST*) and W6YY tacks up the No. 14 × 4 = 16 certification for his call area . . . . . ZC4RP reports the QRT and U.K. return of popular ZC4RF . . . . . From KA7AX of the Far East Network, Kyushu: "At present I'm running only 25 watts to a mere 2E26 on 28-Mc phone but I'm working Europe, Asia, South America, the U. S. and Canada. Frankly, I'm amazed. Of course, it's an advantage to be able to operate below the American phone band!" Bob is W6UUX on our side . . . . . Ex-HL2AM-VO2DB-W7PCZ-KØCSW-K5QBP now awaits his W1 or K1 call at Pease AFB, New Hampshire, together with the XYL, ex-KØHFA-K5PQR. Dom's recapitulation of his Korean ham career counts 873 QSOs with 62 countries and much emergency traffic handled. "Each time I pressed the key in Osan the lights nearly went out. Several neighbors claimed they were becoming adept at blinking Morse with their eyes." . . . . . Asian items via the clubs route: SCDXC has CT1CB's son CR8AB expecting arrival of a new receiver in Goa. Field tests, anyone? . . . WGDXC observes that W3ZA, whose W3ZA/3W authorization expired in the fall, gets in a few ham licks at such neighboring installations as XW8AH. . . . MP4TAC, Trucial Oman, is reported workable around 14,180 kc., A3, at 1400-1900 GMT. . . . KR6HP returns to K2LEQ. . . . AP5HQ's 100 watts and 8X-101 regale the 20-phone flock near 14,115 kc.

Africa — W2KUW supplied 9G1CF with a KWM-1 for a week end in French Togoland which should come early this month. An FD8 suffix may be assigned . . . . . YL K2MGE, with 116 s.s.b. countries worked and 109 confirmed, keeps in touch with OQ5GU's better half, OQ5IE. The latter often runs 50 watts to a ground-plane on 20 c.w. in addition to regular sideband sessions . . . . . "I went with the local ham club down to Ethiopia as ET2US/ET3 on a recent week end," writes ET2TO (WØWET) to W8KX. "Boy, what pile-ups on c.w.! We also used s.s.b. which we believe to be the first ET3 employment of this mode. At ET2TO I usually announce that I am working, or should I say listening, up or down a few kc.; then I don't announce it again until no more stations are calling me on that frequency. Obviously a pile-up gradually builds up on my own frequency but this way I feel I can work the fellows who began calling first and who may be running low power. Asmara is located on an 8000-foot plateau, a good place for DXing." . . . . . W4IYC, keeping close tabs on VQ4ERR, has Robby planning a two-week Seychelles strike in August. "He will have his own power plant and several ops for s.s.b. and c.w." Right now VQ4ERR is momentarily expected to appear again as VQ1ERR in a four-day 'round-the-clock Zanzibar foray. These two ventures, plus recent VQ3ERR work at Arusha, geographical midpoint of Africa from north to south, occur under the auspices of the Radio Society of East Africa with the assistance of W4IYC's Richmond Amateur Radio Club . . . . . In the month immediately following Guinea's departure from French rule, FF8AC/gn was deluged with over a thousand QSOs . . . . . Regarding our April '58 screed on Fort Sao Joao Baptista de Ajuda, intrigued KØHGB writes: "My wife and I applied for visas to the Fort of St. John the Baptist and were courteously given them by the Portuguese embassy in Washington. We were told we were the first non-Portuguese in history ever to ask to go there." John Gunther's *Inside Africa*, p. 599, comments on the place . . . . . ZS8I, carrying the Basutoland DX load almost alone for over two years, tells W9JFT on 10 phone that reinforcements are due, three new ZS8s coming up . . . . . W8YIN understands that ZS6AJ may arrange to serve side-band QSOs this month from the CR7 area . . . . . From W8KX: "EL1K took up ham radio thinking it would be quietly relaxing! He's busy with 15-meter quad

(*Continued on page 164*)



ZL1ABZ of the Kermadecs, as the old blurt goes, needs scant introduction. After frustrating months of 75-meter work Mike recently tried 20 phone where ZL1ABZ dangled on the 14,320-kc. end of many a prodigious pile-up. *(Photo via W7PHO)*

Annual ARRL Novice Roundup Competition

January 31 through February 15

ROUNDUP PERIOD

Starts	*Ends*
Jan. 31	Feb. 15
6:00 P.M.	9:00 P.M.
Local Time	Local Time

THE TIME draws near when we'll once again hear that familiar call of "CQ NR" ringing in our ear phones. Yep, it's the Eighth Annual ARRL Novice Roundup Competition ready to make its appearance! Rules, scoring and participation remain as easy as ever. Non-Novices QSO Novices only sending their QSO number and section, and Novices QSO *either* non-Novices or Novices, exchanging the same info. The maximum allowable operating, listening and logging time is 40 hours, and a participant is not allowed to wear out more than 11 pencils and three keys!

Scoring

To obtain the final score simply add the total number of your NR QSOs to the highest w.p.m. from your Code Proficiency certificate. Multiply the total of these two by the number of *different* ARRL sections (page 6) worked during the contest. And we say this every year. . . . What! no CP award?? then turn to page 94 of this issue for the dates and details of CP runs. Of course you don't *have* to own a Code Proficiency, but any "Old-Timer" will tell you those extra points obtained by having one sure come in handy.

Last year we predicted the 80- 40- 15- and 2-meter bands would get a real workout. This year we know it! And again, it would do well for the Novice to check the frequencies just above and below the 3700–3750 kc., 7150–7200 kc., 21,100–21,250 kc., and 145–147 Mc. frequency segments, as many of the high-power boys will be calling outside the Novice bands in order to eliminate some of the sure-to-be QRM.

How To Participate

KN3EJF in the Maryland-Delaware-D.C. section hears KN7APK in the Washington section calling CQ NR. A correctly negotiated QSO would go something like this:

CQ NR CQ NR CQ NR DE KN7APK KN7APK KN7APK K

KN7APK KN7APK DE KN3EJF KN3EJF KN3EJF AR

KN3EJF DE KN7APK R HR NR 2 WASH BK

KN7APK DE KN3EJF R HR NR 6 MD BK

KN3EJF DE KN7APK R TNX ES 73 SK DE KN7APK

Short, correct, another point and possibly another multiplier added to your score.

Make those last minute rig and antenna checks, study the rules carefully, and drop a line to the ARRL Communications Department for official log forms. Good luck and CU in the NR!

— *R.G.*

Sample log form that must be used by all contestants.

STATION KN3EJF — SUMMARY OF CONTACTS
NOVICE ROUNDUP

Band	*Time on or off air*	*Date, Time of Contact*	*My NR Sent*	*My Section*	*Hrs NR Rcvd*	*Hrs Call*	*Hrs Section*	*Number of each new Section as worked*
80	1801	Jan. 31 1807	1	Md.	1	KN5PCH	S. Tex	1
		1820	2	"	1	KN8GWA	Mich.	2
	1902	1850	3	"	9	W1FGF	Conn.	3
40	1915	1920	4	"	6	KN2HKW	N. N. J.	4
		1930	5	"	5	K5AEO	N. Mex.	5
	2020	2005	6	"	2	KN7APK	Wash.	6
15	1200	Feb. 1 1215	7	"	8	W1TUW	Conn.	—
		1232	8	"	12	W7SUJ	Ariz.	7
		1240	9	"	4	KN9JSO	Ill.	8
		1258	10	"	4	KNØMMX	Kans.	9

Total operating time: 3 hours 18 min.
Bands used: 80, 40 and 15

No. contacts: 10
CP credit: 10
No. sections: 9

Claimed score: 10 contacts plus 10 CP = 20 × 9 (sections) = 180
I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is true and correct to the best of my knowledge.

Signature: .....
Address: .....

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this *QST*.

2) *Time:* All contacts must be made during the contest time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

3) *QSOs:* Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80- 40- 15- or 2-meter bands. Crossband contacts are not permitted. C.w. to phone, c.w. to c.w., phone to phone, phone to c.w. contacts are permitted. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

4) *Scoring:* Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see page 6 of this *QST*) worked during the contest is the "section multiplier." A fixed scoring credit may be earned by

(*Continued on page 158*)

25th ARRL International DX Competition

Phone: Feb. 6–8 and Mar. 6–8;
C. W.: Feb. 20–22 and Mar. 20–22

AMATEURS everywhere in the world are cordially invited to take part in the 25th ARRL International DX Competition, to be held over four week ends in February and March. Canadian and continental U. S. operators will be trying to rack up new countries for DXCC, other stations to complete their totals for WAS and WAVE, and everyone to match wits with others in his country or ARRL Section. But regardless of your input and whether you are out for states or countries or score, you can count on plenty of operating fun in the Test.

The contest rules are exactly the same as those of last year. Stations outside W (K) and VE/VO will call CQ W/VE or CQ TEST and attempt to trade exchanges with U. S. and Canadian participants. The DX will send us 5- or 6-digit numbers indicating the signal report and power input. U. S. and Canadian amateurs, in turn, will transmit an RS or RST report plus their state or province, or some abbreviation for the state or province.

As in the past, certificates are offered to the top single-operator phone and c.w. scorer in each country and ARRL section. A special category recognizes multi-operator stations in sections or countries from which at least three such entries are received. Within an ARRL-affiliated club, single-operator bona fide members may compete for the certificates which go to the highest c.w. and phone scorers. A gavel with an engraved silver band is also earned by the club whose members pile up the biggest aggregate score.

The award and scoring systems encourage flexibility of operation and the widest use of our DX bands (no certificates are offered for one-band work). Thus repeat QSOs are permitted on additional bands. When CR6AI and W3LOE exchange contest information on 10, 15, 20 and 40 meters, for example, the contact-point total,

EXPLANATION OF DX CONTEST EXCHANGES

Stations in U. S. and Canada Send:

	RS or RST Report of Station Worked	*Your State or Province (or Abbreviation)*
Sample (c.w.)	579	ORE
Sample (phone)	57	Oregon

Stations Outside U. S. and Canada Send:

	RS or RST Report of Station Worked	*Three-Digit Number Representing Your Power Input*
Sample (c.w.)	579	075
Sample (phone)	57	500

CONTEST TIMETABLE

Phone Section:

Time	*Starts*		*Ends*	
GMT	Feb. 6	2400	Feb. 8	2400
AST	Feb. 6	8:00 P.M.	Feb. 8	8:00 P.M.
EST	Feb. 6	7:00 P.M.	Feb. 8	7:00 P.M.
CST	Feb. 6	6:00 P.M.	Feb. 8	6:00 P.M.
MST	Feb. 6	5:00 P.M.	Feb. 8	5:00 P.M.
PST	Feb. 6	4:00 P.M.	Feb. 8	4:00 P.M.
The second period starts at these same hours Mar. 6.			The second period ends at these same hours Mar. 8.	

C. W. Section:

GMT	Feb. 20	2400	Feb. 22	2400
AST	Feb. 20	8:00 P.M.	Feb. 22	8:00 P.M.
EST	Feb. 20	7:00 P.M.	Feb. 22	7:00 P.M.
CST	Feb. 20	6:00 P.M.	Feb. 22	6:00 P.M.
MST	Feb. 20	5:00 P.M.	Feb. 22	5:00 P.M.
PST	Feb. 20	4:00 P.M.	Feb. 22	4:00 P.M.
The second period starts at these same hours Mar. 20.			The second period ends at same hours Mar. 22.	

multiplier, and score rises for both. For the DX, the multiplier is the sum of U. S. A.-Canada licensing areas worked per band, while the W/VE multiplier consists of the sum of different countries (see ARRL Countries List, p. 81) contacted per band. No credit for W/VE-to-W/VE QSOs is allowed.

It is suggested that W/VE c.w. entrants refer to this tabulation in indicating states and provinces. Overseas competitors may use it as a check-off list of states and provinces and for logging abbreviations.

W1—CONN MAINE MASS NH RI VT
W2—NJ NY
W3—DEL MD PA DC
W4—ALA FLA GA KY NC SC TENN VA
W5—ARK LA MISS NMEX OKLA TEXAS
W6—CAL
W7—ARIZ IDAHO MONT NEV ORE UTAH WASH WYO
W8—MICH OHIO WVA
W9—ILL IND WIS
WØ—COLO IOWA KANS MINN MO NEBR NDAK SDAK
VE1—NB NS PEI
VE2—QUE
VE3—ONT
VE4—MAN
VE5—SASK
VE6—ALTA
VE7—BC
VE8—NWT YUKON
VO—NFLD LAB

U. S.-Canadian amateurs have quotas on c.w. (see rule 10) but none on phone. DX amateurs have no quotas; they will QSO as many stations as they can in the 19 W (K) and VE/VO licensing areas on each band.

Keep your log carefully and send a copy to ARRL, in the form shown, as soon as the contest ends. It must be postmarked by April 30,

Sample of report form that must be used by W/VE c.w. participants. When a station is worked for less than the maximum number of points allowed, the additional contact to make up the points not earned in the first contact should be entered at the bottom of the sheet. Canadian entrants should allow two blocks for each country, but may record no more than eight contacts therein. A separate set of sheets should be used for each band.

LOG, 25th A.R.R.L. INTERNATIONAL DX COMPETITION

Call..... *ARRL Section*.....
Band 14 ..... *Mc.* *Sheet* 1 *of* 3 .....

Country	*Station Worked*	*Date*	*Time (GMT)*	*Sent*	*Received*
France	F8VJ	2/21	1300	589CONN	479075
	F9MS	2/21	1345	569CONN	579080
England	G2DC	2/21	1306	589CONN	469150
	G4CP	2/22	1245	579CONN	469125
	G2QT	2/22	1255	569CONN	579100
	G3HJJ	3/21	1430	469CONN	559100
	G6ZO	3/22	1822	579CONN	589125
	G5RI	3/22	1851	469CONN	459075
Germany	DJ1BZ	2/21	1315	559CONN	449050
	DL1JW	2/22	1149	469CONN	559080
	DL7AH	3/21	1502	559CONN	559045

1959, to be eligible for awards and *QST* listing. All reports, large or small, are welcome. Convenient sheets are now available free from the ARRL Communications Dept.

Rules

1) *Eligibility:* Amateurs operating fixed amateur stations in any and all parts of the world are invited to participate.

2) *Object:* Amateurs in the continental U. S. and Canada will try to work as many amateur stations in other parts of the world as possible under the rules and during the contest periods.

3) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

4) *Entry Classifications:* Entry may be made in either or both the phone or c.w. sections; c.w. scores are independent of phone scores. Entries will be further classified as single- or multiple-operator stations. Single-operator stations are those at which one person performs all the operating functions. Multiple-operator stations are those obtaining assistance, such as from "spotting" or relief operators, or in keeping the station log and records.

5) *Contest Periods:* There are four week ends, each 48 hours long: two for phone work and two for c.w. The phone section starts at 2400 GMT, Friday, February 6 and Friday, March 6, ends 2400 GMT, Sunday, February 8 and Sunday,

Sample of report form that must be used by W/VE phone entrants and all participants outside U. S. and Canada, phone and c.w. This example is a U. S. A. phone log. Foreign competitors, of course, would have reverse information in the "Sent" and "Received" columns; their "Received" column would show exchanges like "579CAL," "5890NT" (or, on phone, "46 Vermont," "58 Georgia," etc.), indicating signal reports received and different states and provinces worked; their "Sent" column would carry signal reports and power indicators transmitted.

LOG, 25th INTERNATIONAL DX COMPETITION

Sheet 1 *of* 1 ..... *Call*..... *ARRL Section*.....*or Country*.....

Date & Time GMT	*Station Worked*	*Country*	*Record of New Countries for Each Band*							*Exchange*		*Points*
			1.8	*3.5*	*7*	*14*	*21*	*28*	*50*	*Sent*	*Received*	
Feb. 7												
1315	EI2W	Ireland							1	58 Maine	57080	3
Feb.8												
1300	PA0ULA	Netherlands						1		58 Maine	47075	3
1306	G3COJ	England						2		58 Maine	46150	3
1345	PA0VB	Netherlands						2		56 Maine	59080	3
2030	LU1DDV	Argentina						3		58 Maine	57750	3
2310	VP9L	Bermuda				1				57 Maine	56050	3
Mar. 7												
1020	ZL1MB	New Zealand				2				58 Maine	58075	3
1035	VK5LC	Australia		1						47 Maine	46100	3
1105	VK3ATN	Australia		1						46 Maine	45100	3
1421	PA0NV	Netherlands						3		45 Maine	57100	3
Mar. 8												
0925	EI5I	Ireland				3				57 Maine	57050	3
1245	G2PU	England						3			46125	2
1255	G3DO	England						3		56 Maine	57100	3
1350	G2PU	England						3		57 Maine		1
1430	G5BA	England						3		46 Maine	55100	3
2320	YN4CB	Nicaragua				4				58 Maine	58500	3

SUMMARY, 25th A.R.R.L. INTERNATIONAL DX COMPETITION

.....*Entry* (*C.W. or Phone*) *Call*.....*ARRL Section*.....*or Country*.....

Name.....*Address*.....

Transmitter Tubes.....*Power Input*.....

Receiver.....*Antenna(s)*.....

(Logs from W(K) and VE/VO show *number of foreign countries* worked. Logs from other countries show *number of U.S.A. and Canadian call areas* worked.)

Bands	*1.8 Mc.*	*3.5 Mc.*	*7 Mc.*	*14 Mc.*	*21 Mc.*	*28 Mc.*	*50 Mc.*	*Total*
No. Countries QSOd		1		4		3	1	9[1]
No. of Contacts		2		4		8	1	15

Number of Different Countries Worked.....*Number of Hours of Station Operation*.....

Assisting Person(s): Name(s) and Call(s).....

45[2] (*Points*) × 9 (*Multiplier*) = 405 FINAL SCORE

Participation for Club Award in the.....(*Name of Club*)

I certify, on my honor, that I have observed all competition rules as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the ARRL Award Committee.

.....
Operator's Signature and Call

[1] Figure in this box is multiplier.
[2] Count 3 points per completed QSO; see rule 8a.

Sample of summary sheet that must accompany all reports.

March 8. The c.w. section starts at 2400 GMT, Friday, February 20 and Friday, March 20, ends 2400 GMT, Sunday, February 22 and Sunday, March 22.

6) *Valid Contacts:* In the phone section, all claimed credits must be made voice-to-voice. In the telegraph section, only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7) *Exchanges:*

a) *Amateurs in U. S. and Canada* will transmit a three-figure number, representing the RST report; plus their state or province. (The latter may consist of an appropriate abbreviation.) Phone participants will transmit a two-figure number consisting of the readability-strength report plus the state or province. *Example:* W6YY might transmit "579CAL" on c.w., "57 California" on phone.

b) *Amateurs outside W (K) and VE/VO* will transmit six-figure numbers, each consisting of the RST report plus three "power" numbers; the power indicator will represent the approximate transmitter power input. Phone contestants will transmit five-figure numbers, each consisting of a readability-strength report and the three "power" numbers. *Example:* VK2GW, with 100 watts input, might transmit "569100" on c.w., "56100" on phone. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8) *Scoring*

a) *Points:* One point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a contest exchange sent, and two points upon acknowledging an exchange received. Two points are earned by any other station upon receiving acknowledgment of a contest exchange sent, and one point upon acknowledging an exchange received.

b) *Final Score:* W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the number of countries worked on one band plus the number of countries worked on each other band. All other stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE/VO licensing areas worked on one band plus the number of W (K) and VE/VO licensing areas worked on each other band.

Countries will be those on the ARRL Countries List. There are 19 licensing areas: 10 in the United States, 9 in Canada (VO, VE1–VE8). [See Countries List on p. 81 — Ed.]

9) *Repeat Contacts:* The same station may be worked again for additional points if the contact is made on a different frequency band. The same station may be worked again on the same band if the complete exchange for a total of three points was not made during the original contact on that band.

10) *Quotas:* The maximum number of points per country per band which may be earned by W (K) stations *in the c.w. section* is 18, and contacts made on the same band with the same country after the quota is filled will not count. Thus complete exchanges with 6 stations in one country on one band fill the band quota for that country. The maximum number of points per country per band which may be earned by VE/VO stations *in the c.w. section* is 24, and contacts made on the same band with the same country after the quota is filled will not count. Exchanges with 8 stations in one country on one band are thus permitted Canadian participants. There is *no quota* for stations in the c.w. section *outside* of the U. S. and Canada. There is *no quota* for *any* station in the phone section.

11) *Reporting:* Contest work must be reported as shown in the sample forms. Each entry must include the signed statement. Contest reports must be mailed no later than April 30, 1959, to be eligible for *QST* listings and awards. All DX Contest logs become the property of the American Radio Relay League and none can be returned.

12) *Awards:* To document the performance of participants in the 25th ARRL International DX Competition, a full report will be carried in *QST*. In addition, special

(*Continued on page 156*)

Partial A.R.R.L. Countries List — For Your Convenience in the 1959 DX Contest

AC3 ..... Sikkim
AC4 ..... Tibet
AC5 ..... Bhutan
AP2 ..... Pakistan
BV, (C3) ..... Formosa
C (unofficial) ..... China
C3 ..... (See BV)
C9 ..... Manchuria
CE ..... Chile
CE9AA-AM, KC4, LU-Z, VK0. VP8, ZL5, etc. ..... Antarctica
CE9 ..... (See VP8)
CE0A ..... Easter Island
CE0Z ..... Juan Fernandez Archipelago
CM, CO ..... Cuba
CN2 ..... Tangier
CN8 ..... Morocco
CP ..... Bolivia
CR4 ..... Cape Verde Islands
CR5 ..... Portuguese Guinea
CR5 ..... Principe, Sao Thome
CR6 ..... Angola
CR7 ..... Mozambique
CR8 ..... Goa (Portuguese India)
CR9 ..... Macau
CR10 ..... Portuguese Timor
CT1 ..... Portugal
CT2 ..... Azores
CT3 ..... Madeira Islands
CX ..... Uruguay
DJ, DL, DM ..... Germany
DU ..... Philippine Islands
EA ..... Spain
EA6 ..... Balearic Islands
EA8 ..... Canary Islands
EA9 ..... Ifni
EA9 ..... Rio de Oro
EA9 ..... Spanish Morocco
EA0 ..... Spanish Guinea
EI ..... Republic of Ireland
EL ..... Liberia
ET2 ..... Eritrea
ET3 ..... Ethiopia
F ..... France
FA ..... Algeria
FB8 ..... Amsterdam & St. Paul Islands
FB8 ..... Comoro Islands
FB8 ..... Kerguelen Islands
FB8 ..... Madagascar
FB8 ..... Tromelin Island
FC (unofficial) ..... Corsica
FD ..... Togo
FE8 ..... French Cameroons
FF8 ..... French West Africa
FG7 ..... Guadeloupe
FK8 ..... New Caledonia
FL8 ..... French Somaliland
FM7 ..... Martinique
FO8 ..... Clipperton Island
FO8 ..... French Oceania
FP8 ..... St. Pierre & Miquelon Islands
FQ8 ..... French Equatorial Africa
FR7 ..... Reunion Island
FS7 ..... Saint Martin
FU8, YJ1 ..... New Hebrides
FW8 ..... Wallis & Futuna Islands
FY7 ..... French Guiana & Inini
G ..... England
GC ..... Channel Islands
GD ..... Isle of Man
GI ..... Northern Ireland
GM ..... Scotland
GW ..... Wales
HA ..... Hungary
HB ..... Switzerland
HC ..... Ecuador
HC8 ..... Galapagos Islands
HE ..... Liechtenstein
HH ..... Haiti
HI ..... Dominican Republic
HK ..... Colombia
HK0 ..... Archipelago of San Andres and Providencia
HL ..... Korea
HP ..... Panama
HR ..... Honduras
HS ..... Thailand
HV ..... Vatican City
HZ ..... Saudi Arabia
I1, IT1 ..... Italy
I1 ..... Trieste
I5 ..... Italian Somaliland
IS1 ..... Sardinia
JA, KA ..... Japan
JT1 ..... Mongolia
JY ..... Jordan
JZ0 ..... Netherlands New Guinea
K, W ..... United States of America
KA ..... (See JA)
KA0, KG6I ..... Bonin & Volcano Islands
KB6 ..... Baker, Howland & American Phoenix Islands
KC4 ..... (See CE9)
KC4 ..... Navassa Island
KC6 ..... Eastern Caroline Islands
KC6 ..... Western Caroline Islands
KG1 ..... (See OX)
KG4 ..... Guantanamo Bay
KG6 ..... Mariana Islands
KG6I ..... (See KA0)
KH6 ..... Hawaiian Islands
KJ6 ..... Johnston Island
KL7 ..... Alaska
KM6 ..... Midway Islands
KP4 ..... Puerto Rico
KP6 ..... Palmyra Group, Jarvis Island
KR6 ..... Ryukyu Islands
KS4 ..... Swan Island
KS6 ..... American Samoa
KV4 ..... Virgin Islands
KW6 ..... Wake Island
KX6 ..... Marshall Islands
KZ5 ..... Canal Zone
LA ..... Jan Mayen
LA ..... Norway
LA ..... Svalbard
LU ..... Argentina
LU-Z ..... (See CE9, VP8)
LX ..... Luxembourg
LZ ..... Bulgaria
M1 ..... San Marino
MP4 ..... Bahrein Island
MP4 ..... Qatar
MP4 ..... Trucial Oman
OA ..... Peru
OD5 ..... Lebanon
OE ..... Austria
OH ..... Finland
OH0 ..... Aland Islands
OK ..... Czechoslovakia
ON4 ..... Belgium
OQ5, 0 ..... Belgian Congo
OX, KG1 ..... Greenland
OY ..... Faeroes
OZ ..... Denmark
PA0, PI1 ..... Netherlands
PJ ..... Netherlands West Indies
PJ2M ..... Sint Maarten
PX ..... Andorra
PY ..... Brazil
PY0 ..... Fernando de Naronha
PY0 ..... Trindade & Vaz Islands
PZ1 ..... Netherlands Guiana
SL, SM ..... Sweden
SP ..... Poland
ST2 ..... Sudan
SU ..... Egypt
SV ..... Crete
SV ..... Dodecanese
SV ..... Greece
TA ..... Turkey
TF ..... Iceland
TG ..... Guatemala
TI ..... Costa Rica
TI9 ..... Cocos Island
UA1, 2, 3, 4, 6 ..... European Russian Socialist Federated Soviet Republic
UA1 ..... Franz Josef Land
UA9, 0 ..... Asiatic Russian S.F.S.R.
UA0 ..... Wrangel Island
UB5 ..... Ukraine
UC2 ..... White Russian S.S.R.
UD6 ..... Azerbaijan
UF6 ..... Georgia
UG6 ..... Armenia
UH8 ..... Turkoman
UI8 ..... Uzbek
UJ8 ..... Tadzhik
UL7 ..... Kazakh
UM8 ..... Kirghiz
UN1 ..... Karelo-Finnish Republic
UO5 ..... Moldavia
UP2 ..... Lithuania
UQ2 ..... Latvia
UR2 ..... Estonia
VE, VO ..... Canada
VK ..... Australia (including Tasmania)
VK ..... Lord Howe Island
VK9 ..... Cocos Island
VK9 ..... Nauru Island
VK9 ..... Norfolk Island
VK9 ..... Papua Territory
VK9 ..... Territory of New Guinea
VK0 ..... (See CE9)
VK0 ..... Heard Island
VK0 ..... Macquarie Island
VO ..... (See VE)
VP1 ..... British Honduras
VP2 ..... Anguilla
VP2 ..... Antigua, Barbuda
VP2 ..... British Virgin Islands
VP2 ..... Dominica
VP2 ..... Granada & Dependencies
VP2 ..... Montserrat
VP2 ..... St. Kitts, Nevis
VP2 ..... St. Lucia
VP2 ..... St. Vincent & Dependencies
VP3 ..... British Guiana
VP4 ..... Trinidad & Tobago
VP5 ..... Jamaica (including Cayman Isls.)
VP5 ..... Turks & Caicos Islands
VP6 ..... Barbados
VP7 ..... Bahama Islands
VP8 ..... (See CE9)
VP8 ..... Falkland Islands
VP8, LU-Z ..... South Georgia
VP8, LU-Z ..... South Orkney Islands
VP8, LU-Z ..... South Sandwich Islands
VP8, LU-Z, CE9AN-AZ ..... South Shetland Islands
VP9 ..... Bermuda Islands
VQ1 ..... Zanzibar
VQ2 ..... Northern Rhodesia
VQ3 ..... Tanganyika Territory
VQ4 ..... Kenya
VQ5 ..... Uganda
VQ6 ..... British Somaliland
VQ8 ..... Chagos Islands
VQ8 ..... Mauritius
VQ8 ..... Rodrigues Island
VQ9 ..... Seychelles
VR1 ..... British Phoenix Islands
VR1 ..... Gilbert & Ellice Islands & Ocean Island
VR2 ..... Fiji Islands
VR3 ..... Fanning & Christmas Islands
VR4 ..... Solomon Islands
VR5 ..... Tonga Islands
VR6 ..... Pitcairn Island
VS1 ..... Singapore
VS2 ..... Malaya
VS4 ..... Sarawak
VS5 ..... Brunei
VS6 ..... Hong Kong
VS9 ..... Aden & Socotra
VS9 ..... Maldive Islands
VS9 ..... Sultanate of Oman
VU2 ..... India
VU4 ..... Laccadive Islands
VU5 ..... Andaman and Nicobar Islands
W ..... (See K)
XE, XF ..... Mexico
XE4 ..... Revilla Gigedo
XV5 ..... (See 3W8)
XW8 ..... Laos
XZ2 ..... Burma
YA ..... Afghanistan
YI ..... Iraq
YJ ..... (See FU8)
YK ..... Syria
YN, YN0 ..... Nicaragua
YO ..... Roumania
YS ..... Salvador
YU ..... Yugoslavia
YV ..... Venezuela
YV0 ..... Aves Island
ZA ..... Albania
ZB1 ..... Malta
ZB2 ..... Gibraltar
ZC3 ..... Christmas Island
ZC4 ..... Cyprus
ZC5 ..... British North Borneo
ZC6 ..... Palestine
ZD1 ..... Sierra Leone
ZD2 ..... Nigeria
ZD3 ..... Gambia
ZD6 ..... Nyasaland
ZD7 ..... St. Helena
ZD8 ..... Ascension Island
ZD9 ..... Tristan da Cunha & Gough Islands
ZE ..... Southern Rhodesia
ZK1 ..... Cook Islands
ZK1 ..... Manihiki Islands
ZK2 ..... Niue
ZL ..... Chatham Islands
ZL ..... Kermadec Islands
ZL ..... New Zealand
ZL5 ..... (See CE9)
ZM6 ..... British Samoa
ZM7 ..... Tokelau (Union) Islands
ZP ..... Paraguay
ZS1, 2, 4, 5, 6 ..... Union of South Africa
ZS2 ..... Prince Edward & Marion Islands
ZS3 ..... Southwest Africa
ZS7 ..... Swaziland
ZS8 ..... Basutoland
ZS9 ..... Bechuanaland
3A ..... Monaco
3V8 ..... Tunisia
3W8, XV5 ..... Vietnam
4S7 ..... Ceylon
4W1 ..... Yemen
4X4 ..... Israel
5A ..... Libya
9G1 ..... Ghana
9K2 ..... Kuwait
9S4 ..... Saar
..... Aldabra Islands
..... Nepal
..... Republic of Guinea

Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

NOVICE DXCC

Asheville School
Asheville School, N. C.

Editor, *QST:*

I am sure all hams wish to join me in saying "well done" to Bill Tippett, holder of the first Novice DXCC as KN4RID. It was a hard feat to accomplish and, I am sure, an achievement not soon to be forgotten by our fraternity. I believe we could all enjoy our hobby to its fullest if we practiced the good clean operating and dedication of purpose which Bill exhibited and is still carrying forth. This knowledge to me is first hand since I get a chance to hear him on often and follow his activities.

— *Sam Wyrick, K4RBV*

REG BREAKERS

652 Second
San Bruno, California

Editor, *QST:*

Recent issues of *QST*, including letters to the editor, have denounced the superpower violators. I do not care for those who deliberately break our regulations; dozens of which can be found in an evening, signing improperly, etc. Yet this "aghast" pretense is as artificial as a preacher in full cry after discovery of sin. When you print a letter from a man who is over DXCC 200, and who attacks input power over 1 kw., please call my attention to it. Hi.

— *Lester Sade*

(See W3VKD letter page 74 November, and his listing of 231 countries page 104 December.—*Ed.*)

POSITIVE MULTIPLIERS

1110 Runnymede
Sun Valley, Calif.

Editor, *QST:*

In reference to Mr. A. L. Worrom's letter in the November *QST* where he states "that any fuddy duddy that rolls his own should be penalized" — I believe he should go soak his head.

Any amateur who has the gumption to take a schematic and turn it into a workable and efficient piece of communications gear should be given positive credits on any contesters' contest.

— *Alan R. Ogden*

706 Commonwealth Ave.
Duluth 8, Minnesota

Editor, *QST:*

. . . I imagine 8AOF's letter struck quite a sore spot in many circles. I fully agree with the man. *QST* has become nothing more than a catalog for commercial radio gear! Granted, there are usually a couple of construction articles carefully squeezed between the advertisements, but I suspect they are condensed in order to make more room for these advertisements.

. . . Today, we are not only plagued with QRM and the like, but we also have a new menace: the "commercial ham." Ask him how to tune up his new Super s.s.b. rig, and he begins: "Well, you diddle with the first chrome-plated knob on the left until the meter reads '10' . . . no, I don't know what that knob does, but the instruction manual says. . . ."

. . . When I get on the air again with the s.s.b. rig that is still in the noodle-scratching stage as yet, I would like to enter 8AOF's contest, but since all my equipment is home-built, and I use a rebuilt Super-Pro Receiver, the negative multipliers would probably make my score so low, I'd be wasting my time.

— *Roscoe R. Dunbar, Jr., W8TKO/9*

599

7921 Woodlawn Avenue
Chicago 19, Illinois

Editor, *QST:*

I just purchased a new *Call Book* and during quiet hours I looked at the frontispiece. I read that an S9 Signal is an extremely loud signal and that T9 is the "purest of d.c. notes." Are they talking about the S9 and T9 reports that I am hearing on the air or do I always hear the "other guy?" Let's take the case of the local boy working out DX-wise. I have been listening a year in Chicago and all the c.w. reports I hear wind up in T9. (Let's see — purest of d.c.) Are we men or mice? Let's face it, men — those foreign signals range from T3 to T9 and most of them are little better than S7, but all I hear is "T9 old boy." Are we perjuring ourselves to get a possible QSL card? These foreign boys are sharp operators too. They know they don't have that so called "pure d.c." I bet some of them put their tongue in their cheeks when we whip back with that old T9 report. S9 is the top of the scale. Your ham friend down the street has an S9 signal because he blocks the receiver. That is true "extremely loud." Just how many 25 watt foreigners with a dipole block your receiver? Well, if they don't then it would appear that they are not true S9.

An honest man is a respected man; I don't think our chances for a QSL would be undermined by a true report to the overseas stations. Why can't we hear from a couple of them through this column? Let s not commit mild perjury for the sake of a scrap of paper. The game is in fun men, fun. You can't buy a suit of clothes with a stack of QSLs so they only represent our hobby. If we prevaricate, we take something out of the game. Let's be honest!

— *Bill Roberts*

IRCs

3529 Sargent Street
Madison, Wisconsin

Editor, *QST:*

Most of the DXers realize that the DX stations who make thousands of QSOs with stateside stations couldn't possibly afford to send each one a QSL card direct or even via the Bureau. Therefore, many of us who are interested in working these DX stations and receiving the confirmations of the QSO send the DX stations sufficient IRCs (International Reply Coupons) or a dollar to cover the postage for a return card. I have been wondering what some of these stations do with the IRCs and the dollars they receive and don't even have the courtesy of returning a card via the bureau. Some of these stations who don't intend to QSL should mention the fact that they do not QSL and we wouldn't expect to receive one. I feel the final courtesy of a QSO is the QSL card especially when I send them the necessary postage for a return card.

— *Elmer C. Zindars, W9HCR*

FREQUENCY WATCHING

309 Ross Street
Steubenville, Ohio

Editor, *QST:*

I have often heard comment in the local ham club about net operation, and the most pertinent question is: "What times and frequencies are available for the fellows who have not checked into nets and do not particularly care to get into a net?" The best one was about the W3 that found a clear spot about 3 in the afternoon and let out with a CQ and was promptly answered by a guy that was "watching" the frequency to keep it clear for the high-school crowd that was due in 45 minutes, and would he please "move up or down and off the frequency." I would not venture to say

(*Continued on page 166*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
ROBERT L. WHITE, W1WPO, DXCC Awards
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.
LILLIAN M. SALTER, W1ZJE, Administrative Aide
RONALD GANN, W1FGF, Club Training Aids
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

DX Contest Note, Attention Foreign and Overseas Amateurs, Please. The "happiest" DX Contest, or operating in any contest at any time for that matter, is one in which propagation conditions are good, and the number of stations looking for each other and in contact are substantially equal, on each side of the fray. The stations should, of course, be well spread out over the appropriate and available bands to avoid pile-ups, give decent tuning conditions and insure reliable communications.

The tuning procedures, and calling methods to prevent or reduce pile-ups, are important. Here is a *special request* for all amateurs who represent a "country," a request for all amateurs outside W-K and VE-VO prefix areas! *Please* include in your radio calling *where* you are going to tune, when you call CQ DX or QRZ? We hope there will be a minimum of domestic stations who clutter the bands with CQ DX. It is *more productive* for the average local in our North American continent to select DX stations following their own calls, or as available after another QSO.

As we see it, here is the simplest way to reduce that QRM level. A method that has gained considerable popularity is as follows:

CQ DX 15 U DE KR6AK 15 U K (c.w. example)
or
"Answer 15 kilocycles *up* from my frequency, go ahead" (when using voice.)

It is always possible just to add a U or D to give the general indication that calls or replies are expected above (up) or below (down) from the given frequency. This does a lot to help spread out the calls and to keep the QRM calling-level from going up unduly right on your own frequency, where it is likely to hurt most.

It's even a help if our overseas voice operators will only state that they are going to tune the VE band, or from the bottom of the American band down, or the top of the American phone band up. This prevents all the different North American stations from calling popular DX at the same time over the entire band and raising the QRM levels unduly.

Advance information on the DX Contest (full announcement) is given this month to reach overseas points before the February-March Test. This announcement has been buttressed by our direct mailings to key foreign societies and special DXers representing hard-to-get places. We hope the conditions will make for smooth going for everybody. Best of luck and good operating!

Code Practice Work Serves Many. A lithographed list of stations participating in general code practice work (calls, speed, frequencies, times) is available to interested newcomers or others *on request*. It includes a list of the amateur stations in all licensing areas and identifies additionally certain MARS, Naval Reserve, and press stations working outside amateur bands that have transmissions useful either to newcomers or for advanced code work in the case of some of the stations sending press. We'll also send you with this the general operating schedule of W1AW so you can take advantage of that nightly tape-sent material.

Warning: Re Harmonic Radiations. FCC form 1096 now accompanies the new license received by Novice amateurs. This is a special CAUTION to avoid violations, and makes reference in particular to the radiation of *harmonics* in violation of the rules. All too many emissions of signals outside the amateur bands are resulting in the need for monitoring station notices to Novice operators. Two examples are given (in Form 1096) of how transmitters may radiate signals on multiples of the crystal frequency. Also three cautions: (1) Be sure the transmitter is tuned to the desired output, not an unauthorized harmonic frequency. (2) Listen or have a nearby amateur listen for harmonics. (3) If heard, consult amateur literature and apply the recommended precautions or correctives.

A final reminder: For compliance, periodic checks are advisable. ARRL recommends, in any event, checking whenever a change or previously unchecked crystal or transmitter-antenna combination or adjustment is tried.

Additional FCC Suspensions. One previously unreported FCC suspension order concerns FCC action for fraudulent means used in acquiring an amateur license. Another is at hand concerning transmission of sidebands extending beyond the A-3 sub-band limit. We record the following excerpts from the pertinent orders:

FCC ordered (May 28, 1958 and June 4, 1958) that the General Class amateur radio operator license (K6VAW) of Anthony D. Goodman, North Hollywood, Cal. BE SUSPENDED for its entire term, normal date of license expiration Sept. 25, 1962, under authority contained in Sec. 303 (m)(1)(F) of the Communications Act and Sec. 0.292(f) of FCC rules, his amateur license to be mailed the office of FCC at Washington, D. C., *it appearing that the licensee* had wilfully and knowingly secured the license by fraudulent means, in violation of Sec. 12.162 of Part 12, FCC rules. It was discovered that the written examination and code test which he purported to have taken was in fact taken for him by one Michael A. Kaufman, Sherman Oaks, Cal. This order became effective last June 24th.

FCC ordered (April 3, 1958) a hearing on Docket 12286 pursuant to the earlier order suspending the Advanced Class Amateur Radio Operator License (W6OBH) of Marvin H. Smith, Hermosa Beach, Cal., *it appearing that said licensee's station W6OBH* was operated on specified earlier dates with A-3 emission with sidebands extending outside the radiotelephony frequency band 14.2–14.3 Mc., a violation of Sec. 12.113 of FCC rules, and a hearing having been applied for. In lieu of a hearing, the parties by agreement of both sides submitted briefs. The one month suspension order was reaffirmed by the Hearing Examiner and penalty invoked Sept. 17th to Oct. 17th '58.

In this case W6OBH had received notice of July 7, 1957 and July 28, 1957 violations for using A-3 with sidebands extending outside the radiotelephony frequency band 14.2–14.3 Mc. Having admitted this earlier violation and stated that the crystal controlling the frequency would be reground by the manufacturer, the same crystal was without modification employed in July 28th operation, resulting in a similar notice of violation from the Monitoring Station. FCC did not accept the statement of a special purpose alleged in the use of the band-edge crystal on July 28th as an excuse. FCC ordered its action to impress on the licensee the necessity of compliance with the standards imposed on the holders of amateur licenses.

QRM in Net Operating. From time to time we receive complaints of interference as a result of side issues resultant from net operations. The Net Directory issued annually by ARRL assures general good coordination between nets themselves. Consulting it permits wide latitude of time-of-operation or frequency, or advance agreements between net controls, the smartest way to work out difficulties or prevent them from arising.

The shifting of two or more stations, or pairs of stations 5 or 10 kc. either side of one's net frequency will sometimes give rise to difficulties. The practice is a good one from the standpoint of a given net, to permit roll-calling to continue and move the heavier traffic operations to some adjacent channel, as stations are paired up to steer messages to their logical destination or relay points. It is probably better to move to a frequency some *odd* member of kc. away, than to make the move right to some other net's frequency! However, in using *any* such system of operations, we would urge each responsible NCS to check or have checked the adjacent frequencies to determine if the suggested spots are already clear! This is most important at "peak of the day" operating times when several nets are simultaneously in operation.

Such net practices that give no trouble in the season when days are long, may unfortunately run into a few months of extreme difficulty and justified QRM 'plaints under all-dark and winter-season 3.5 Mc. conditions. Unfortunately a spot check in summer or early fall will not assure that your plan of operation is trouble free all the winter months.

R-S-T. Personally, one's RST almost always holds interest. At least this is so with the casual amateur operator as opposed to the fellow in record communications. With the traffic handler the completeness of the text received spells out to perfection the readability over the period of work without the limitations of offhand evaluations. There have been aspersions cast at RST in view of the human tendency to flatter. Like any tool, RST can be carefully used or abused and reports made carelessly. When using crystal filters and *Q*-multipliers there are self-imposed factors that make it difficult to evaluate a correct RST report rapidly. But logs show that many amateurs do give conscientious reports. Looking at S8 logs discloses wide variations in RSTs sent and received in accordance with actual signal conditions. Naturally W1AW with a bigger signal will get more S8 and S9 reports than those of us with a backyard size antenna of less effective height and the rig running lower power. W2PEO's transistor rig, for example, received some 229 reports. So give RST its due credit and resolve to use it correctly as a helpful tool.

Extend the value of your RST reports by always adding the C or K for chirp or click, as this is noted. Asking for a critical report is a good way to insure that someone takes a careful look at your signal. Personally we always hope the operator giving a report has his eye on the RST-definitions. We keep a set posted in our operating position and you might like to do the same. All RST meanings are available for quick reference in your operating position too. Ask for Operating Aid No. 3. A radiogram will bring this (gratis) from ARRL or you can simply refer to the *Handbook* or page 15 of *Operating an Amateur Radio Station*.

Code Practice Station Schedules Solicited. An early '59 revision of our list of current on-the-air Code Practice Stations is contemplated. We invite all operators and stations that have participated in such work in 1957 and 1958 to drop us a line with a confirmation (or change) in their current schedules. Also give us the speed ranges followed for particular days of the week.

Clubs that have 'round-the-table code practice sessions are welcome to make tape recorded versions of the different speeds we run from W1AW to be repeated at the hours convenient for their local amateur groups to get together. Such plain language material cannot be repeated on the air, of course, unless *one's own station identification* is inserted at appropriate ten-minute intervals in place of W1AW's call. There is a great need for more on-the-air code practice runs, according to some of the letters we receive from interested people.

Remember in setting up a schedule, please, that you are assuming your responsibility to follow this for a given or designated period of time. It takes us six to eight weeks after getting information together to get it in print in *QST* and suitably lithographed for distribution. Therefore something that you can do over just the next three or four weeks really is not a suitable subject for listing. But if you can plan beyond that we very much want your schedule for listing.

Our tape gear at W1AW utilizes Boehme equipment and special punched tapes; a limited number of used W1AW tapes are available for any amateurs in this on-the-air ARRL program to help meet code exam (and higher) requirements for enjoyable proficient amateur operating. Any user must guarantee to substitute his own identification on tape and delete or take out

W1AW identifications on any old tapes provided, however. We have *only* such *punched* tapes.

We conclude with the thought that the v.h.f. bands, especially the central portion of the two-meter band, also those frequencies in or near the Novice-designated frequencies of 3.5 and 7 Mc. are probably those on which the greatest service can be rendered. We would suggest a choice of hours a little earlier or later than the peak periods of band congestion and operation. A check against the net registrations recently reported in these columns, in order to minimize interference with groups otherwise engaged at the same time, is suggested. Here is a fine way to assist the new fellows coming into the game and those that want to go further with their code ability. We have a circular that suggests the best way to go about transmitting practice material, including the FCC regulations that cover such special work. We need any *continuing* schedules to help answer the requests. May we hear from you?

—*F.E.H.*

We have discovered, much to our astonishment, that quite a few *QST* readers get this far back into the magazine, reach for their magnifying glasses and dive into the fine print. This makes us self-conscious. It isn't easy to think up a subject for this heading every month — a *suitable* subject, that is — but we continue to believe that a topic of general interest to emergency communicators is appropriate in this column as an appetizer for the chronicle of amateur emergency activity which follows. You fellows out there have to supply the latter. Perhaps you would like to help out with the lead as well. What would you like to see discussed? Name your (non-technical, please!) subject and we'll write about it. Then you can disagree with what we say.

As amateur radio gets bigger, so does the AREC, so does RACES and so does the interest in emergency communications activities in general. Besides making more work for us, this of course makes the issue more complex and more diverse. By the time you read this (before, we hope), ECs will be getting the annual EC Report Form to be filled out and returned to headquarters, with a copy to your SEC. Our customary return on these forms is about twenty per cent. Can we do better than that this year? We have noticed that many SCMs are cleaning out their deadwood in ECs and that new appointees have given local AREC units a new start, renewed vigor, fresh interest in the desire to do something useful in the public interest in the name of amateur radio. Yet, the total number of EC appointees has not decreased. We hope this means our year-end statistics for 1958 will show that AREC is stronger than ever, and we are confident that they will. However, the accuracy and significance of the statistics derived depend in large part on the extent of the "sampling" — that is, the more complete reports we receive, the more accurate will be the over-all estimates we are able to make. This is up to you. Let's have those reports, you ECs.

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Hurricane Helene caused quite a stir down south, but so far we have received no reports of extensive emergency communication. Amateurs in South Carolina and Virginia were ready for the worst. The South Carolina Emergency Phone Net on 3930 was activated on Sept. 26 at 1200 and remained constantly on the alert until the danger was past. The South Carolina Amateur Radio Activities Bulletin reports much traffic on SCFN concerned with weather reports and initiation of plans by c.d. officials and others concerning evacuation and preparation in the danger area. The regular 1930 net was suspended. K4PJE, W4HDR, K4IOE and W4GIF, assisted by others for brief periods, alternated as NCS throughout Friday night and Saturday morning. By midnight it was apparent that the state was going to escape the full force of the blow, and the hurricane moved parallel to the coast while still many miles out at sea. In some places where commercial power was disrupted by the 50–60 mile-per-hour winds along the coast emergency power was cranked up and continuous contact with the critical areas of Charleston, Georgetown, Myrtle Beach and Conway was maintained. The net remained alert hours after the real threat had waned, handling traffic for both local and out-of-state stations concerning the welfare of individuals. It was felt unnecessary to obtain clearance of the net frequency from FCC.

The South Carolina CW Net was activated for emergency duty on Friday evening, and operation was maintained until 1000 Saturday. Liaison was provided with National Red Cross headquarters in Washington through K4USA with S. C. Radio Officer W4ZRH at the key, who secured FCC clearance from 3790 to 3810 kc. for emergency net operations. A tie-in was provided with the Coastal Emergency Net through W4DVR and W4DNX. The most outstanding performance was that of W4DAW at Charleston, who maintained a constant vigil throughout the alert. Thirty-three messages were handled, in addition to advisories. Net control stations were *K4s* AVE BVX, *W4s* PED DVR AKC CHD and DAW. Other participating amateurs were *K4s* BLF GAT GDL EJR DGJ LCF GPI SSB BAI, *W4s* NTO ZAP QCC CAL CJD BJE ANK DFU SOF SOY BIH WHC EET JWO WV, K8HID and W3ZRQ.

The South Carolina SSB Net operated from 1500 Sept. 26th until 0900 Sept. 27. Fifty messages and other informal contacts were handled during the emergency alert. The entire operation was put on tape and broadcast over WIS and WIS-TV in Columbia to keep the central part of the state informed of the hurricane's progress. Net Manager K4EGI makes special commendation of the following participating stations: *W4s* YJE TUN ZJ FFH ARE/4 HMG TWE FAV OHN DYP, *K4s* BUJ BGN RLX.

Virginia CW Net was on alert during the hurricane but handled no hurricane traffic. The net remained in session from 1900 until 2202 EST. W4CVO reports handling hurricane traffic into Washington. K4EZL made a news broadcast over station WFCR, giving them some information about the hurricane that they did not have.

In Florida, K4ISA, by monitoring the South Carolina nets, was able to furnish radio station WMFJ in Daytona Beach and WSBB in New Smyrna Beach with valuable information on the hurricane, according to a report from K4LCF.

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There was no SET in Nodaway County, Mo. Nature provided the real thing. On Oct. 8, tornadoes struck several points in Missouri, leaving three towns without electric service or long distance telephone lines. This happened at about 1930. At 2025, WØTXP/m, accompanied by WØWQA, proceeded to the storm area at Grant City to investigate, while WØYOI manned the c.d. control station, KØITZ. KØDXL and KØLGM stood by on the frequency to assist. The first report of damage came from the Parnell area from WØTXP/m to KØITZ, about 20 minutes before law enforcement officers arrived at the scene. The mobile then continued to Grant City and carried first word to the residents of the city, then returned to Maryville. Information gained by the mobile unit was used to answer inquiries during the night from outlying areas. WØTXP handled traffic from the Kansas City Red Cross via WØAEU, and from persons having relatives in the area via WØGKN. The following morning, WØTXP/m returned to the damaged area and was able to assist badly-overloaded telephone communications in the circuit from Worth County Red Cross to RC headquarters in Kansas City. Then WØTXP escorted Red Cross representatives and the presiding judge of Worth County on an initial survey of the damaged area, maintaining radio contact all the while. The mobile retired from the area at 1430, by which time telephone service was essentially normal. — *WØTXP, EC Nodaway Co., Mo.*

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W7EKW, on his way home from work in Aberdeen, Wash., came upon an accident. From his mobile unit he

In Feb. '58 *QST* (p. 87) we ran a photo showing the innards of the Dade County (Fla.) Civil Defense Control Center in Miami. We thought you might also like to see what the "outards" look like. This building, constructed specifically for the purpose, has concrete walls and ceilings two feet thick, reinforced with steel, and no windows. It has 11 air conditioned rooms, its own well for pure water, 150-kw. emergency power, a special air-filtering room, showers, lockers and storage space—also well-equipped workbench facilities.

contacted W7ZEP in Spokane, who called the state patrol office, which immediately contacted Olympia and dispatched a patrol car. The car arrived at the scene exactly 18 minutes after first contact. W7VLX assisted in the operation.

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On Oct. 14 K4CQV, operating KG4AO at Guantanamo Bay, Cuba, was surprised to hear an emergency call to Guantanamo Bay on 14,241 kc., but was unable to identify the station. He contacted W4AZK who, after a little calling, ascertained that the calling station was W4SGH in Jacksonville with emergency traffic for KG4AA. K4CQV thereupon called KG4AL (operator at KG4AA) on the landline and in ten minutes KG4AA was on the air. With the assistance of W3DLK, the message was delivered, informing a service man that his boy had been bitten by a rattlesnake and was in serious condition. The father was brought to KG4AA and was able to communicate with his home in Sanford, Fla., via W4SHG. Another job well done by amateur radio. — *K4CQV.*

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The Hughes Amateur Radio Club (K6QEH) of California handled radio communications for an attempted Catalina Channel swim from 1900 Sept. 12 to 1100 Sept. 13. The amateurs maintained communication between the swimmer's escort boat and K6QEH at the club house. Good publicity for the local amateurs was afforded by this event.

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Three amateur groups have so far reported Goblin Patrols to minimize acts of vandalism on Hallowe'en night, Oct. 31.

In Cuyahoga County (Cleveland), Ohio, the operation was an example of the excellent cooperation and coordination between RACES and AREC groups. Occasioned by the moving of Cleveland Heights C.D. Headquarters, a request was made by the county radio officer to AREC for portable equipment and manpower to furnish communications for c.d. personnel engaged in such patrol duties. The AREC responded with two portable units to furnish a link between the police dispatcher and c.d. headquarters, a portable station for net control, and five mobiles for patrol duty, all on six meters. The amateurs handled much traffic relating to vandalism, fires, etc., as usual demonstrating their effectiveness under all types of circumstances. Twelve amateurs participated. — *W8AEU, EC Cuyahoga County, Ohio.*

Four mobile units of the SWANI (Southern Wisconsin & Northern Illinois) Radio Club patrolled the streets of Woodstock, Ill. on Hallowe'en night to provide communication for the chief of police, who said that radio communication that night was "like it has never been before." A police officer rode in each mobile unit. The exercise served as a drill of the McHenry County RACES program. — *W9KMN, EC McHenry Co., Ill.*

Six amateurs used six-meter mobiles in the Bellbrook, Ohio, area to assist law enforcement officers in keeping track of activities on Hallowe'en and at the same time practice their RACES procedures. A base station was set up to control the mobiles so that police officers knew what was going on in all parts of the area at all times.

Getting so we kids can't have any fun on Hallowe'en any more!

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We had a good month for SEC reporting in September. Twenty-five SECs reported for 5829 AREC members. This is one more report than September of last year, but considerably fewer AREC members are represented. Three new sections for 1958 put in an appearance: West Virginia, Oklahoma and Saskatchewan. Welcome, friends! Other sections reported: W. Fla., W. N. Y., So. Texas, NYC-LI, N. Mex., Santa Barbara, Mont., Minn., Ga., Colo., E. Fla., East Bay, San Joaquin Valley, Ala., Santa Clara Valley, Vt., B. C., R. I., Wis., Maritime, Conn., E. Pa., Mich.

RACES News

OCDM informs us of an error in the state r.o. listings of October *QST*. It seems one of the area r.o.'s was listed for Louisiana. The state r.o. is Kenneth J. Jumonville, K5BES. Also, in Montana the state r.o., W7GFT, has joined the OCDM staff at Region 1 headquarters in Harvard, Mass., so you can cross out that name too; we have no information on his replacement. While we're at it, we should mention that K5KFS, Ed Burns, informed us that he is both the new SEC and the new state radio officer for Oklahoma; no official confirmation of this yet from OCDM, but we have assumed the information to be correct, so you might as well also.

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Here's an OPAL supplement, which WØRRN says was not reported for South Dakota for the October *QST* writeup. The Sioux Falls area was right in there during OPAL and the boys deserve credit. Upon receipt of the alert signal they jumped into their communications truck and moved out of the "fallout" area, parking atop a hill. Seven minutes later the generator was running, antennas were up and contact had been made with c.d. headquarters and with Aberdeen which was designated emergency capital of the state. Operation continued from 1000 until 1800, with at least 3 operators on duty at all times. Considerable traffic was handled for the Aberdeen station, which was having trouble. The following day, operation continued until secured by c.d. officials. The boys in Sioux Falls seem to have an excellent c.d. setup and are justifiably proud of it.

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On Sept. 27 and 28 a joint St. Louis-St. Louis County c.d. drill called "Operation Simulation" was held at Weldon

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

Springs, Mo. Over 400 people participated. Almost all communication was handled by RACES. Teams of subversives tried breaking security lines, sabotaging radio equipment and jamming radio frequencies. The state civil defense director was one of the spectators. Much experience was gained by the participants, and a closer liaison between RACES and c.d. was deemed necessary.

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OCDM Region 7 has an effective regional RACES network in operation with K6HA as net control. Using 3505.5 kc., regular contact is maintained with representatives in the eight states of the region. Contact is also maintained with Alaska, Hawaii and American Samoa on 14 Mc. Tests are conducted each Monday. Regional Communications Director K6HA reports that a number of Santa Cruz (Calif.) amateurs have volunteered their services as backup radio staff at K6HA and each Monday sees additional amateurs at the regional office for training. An active amateur will soon fill an additional communications operator position at the regional office, after which more attention will be devoted to the amateur side of c.d. communications.

TRAFFIC TOPICS

It has been called to our attention that in the lead for this column in November *QST* (which, by the way, created quite a stir), we neglected to qualify the statement "in any case you must identify at ten minute intervals" by adding " . . . or as soon thereafter as possible." This may seem to make a lot of difference, but if you look up the word "possible" you will see that it means "within the powers of performance." The phrase "as soon as possible" does *not* mean "as soon as *convenient*," or "as soon as *practicable*." It means just what it says. Under any kind of normal circumstances it will seldom be impossible to identify at ten minute intervals. Perhaps your net has used improper identification procedure for many years and no one has ever been cited for it. That's fine. We hope your luck will continue to hold out.

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During October we had the pleasure of a visit by the MARS-Army chief, Major Ed Schaad, W3WDF and his assistant, Ed Liscombe, K4KNV, with whom we took the opportunity to discuss several matters of common interest. Traffic men will be interested in the results of some of these discussions.

To begin with, the MARS mission is strictly military and is in no way interested, officially, in having its procedures adopted by amateurs operating in the amateur bands. Be this as it might, many amateurs have brought military procedures into the amateur bands to the confusion of our own traffic nets, and there has even been a bit of strife developed concerning the proper method of refiling MARS traffic into amateur nets and the origination of amateur messages to be handled by MARS overseas circuits. Although the MARS mission is primarily training, it has willy-nilly been catapulted into the traffic handling "business" and finds itself faced with the necessity of straightening out some of the procedures of MARS vis-a-vis amateurs; for to a large extent MARS has had to depend on amateur nets to take much of its non-official traffic to its destination (particularly "morale" traffic originated overseas) and amateurs have had to depend on MARS to handle replies to such traffic or originations to overseas points with which we amateurs are not ordinarily authorized to handle third-party traffic.

MARS is not particularly interested in having amateur traffickers solicit traffic to overseas points, as some amateurs have done. Their overseas circuits are already overloaded. If you are one of those who have been soliciting traffic of this nature, except in reply to messages delivered, you are requested to cease and desist. This does not preclude spontaneous originations, of course; it only means that you should not go out of your way to obtain such traffic. MARS already has more than it can handle.

The refiling of MARS messages into amateur nets came in for a good deal of discussion. Procedure for doing this has been discussed before, both in *QST* and in MARS directives and manuals. During the October discussions, we came up with some new ideas on the subject, based on the following principle: that since MARS is not an amateur service, a message received via MARS to be forwarded to its destination by amateur radio should be treated just as you would treat that message had you received it by, for example, mail.

This procedure is covered in our operating booklet in general terms but let's discuss briefly this particular application. The number of the message is *your* number, because *you are originating this message*. The "refiled" message will contain your call as the station of origin. The "check" will be the amateur text-only count; you can indicate the original (MARS) check if you wish (e.g., 10/12), but it isn't necessary because this is a message origin, not a relay.

When we get to the place of origin we come in for some difficulty. If you received the message by mail from, for example, Fort Worth, Texas, your place of origin would read "Fort Worth, Texas, via Yourtown, State." Therefore, *this is the way you should do it in refiling from MARS to amateur*. The designation "via MARS" should not be added *unless* the message originated in a foreign country with which amateurs are not normally allowed to handle traffic. Otherwise, you don't care whether the message was handled via MARS, via Western Union, via RCA or via Uncle Sam's mail. But if the message did come from such a foreign country, the place of origin should read something like this: "Korea via MARS via Yourtown, State." On c.w., the "via MARS" can be abbreviated to VM.

MARS traffic generally uses the date-time group in place of our filing time and date. When "refiling," this should be converted to a separate filing time and date, in that order. This is quite simple. The first two digits are the day of the month, the next four are the time (24-hour system) and the letter at the end is the time zone designation. Z stands for Greenwich Mean Time, and there is no need for you to convert this to your own time zone; in fact, it is improper for you to do so. Thus, if you receive the message with the date-time group of 031900Z, your conversion would read 1900Z NOV (or whatever month) 3. We explain this in some detail because many date-time groups get into the amateur bands; should you receive a message containing such, it is proper for you to convert it to amateur procedure.

The rest of the message needs no explanation because it is the same as amateur, except the signature, which in MARS is part of the text. This usually makes the check count different when you put it in amateur form.

A service message regarding an undeliverable refile should be addressed to the station who refiled it. He will then get the correct information through MARS circuits and relay it to you.

MARS "refiles" count as originations for the station refiling them, not as relays. If you deliver a message received on MARS, it does not count in your amateur traffic either as *received* or *delivered*. If you put a message received on an amateur circuit into a MARS net, your amateur count is one *received*.

We are not concerned here with the procedure for refiling from amateur to MARS. This is strictly a MARS matter.

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Net Reports. Hudson Traffic Net had 27 sessions, 178 check-ins and handled 280 messages. Interstate SSB Net reports 31 sessions, 1057 check-ins, traffic count of 931. Early Bird Transcon Net held 31 sessions and handled 1015 messages. The 7290 Traffic Net had 46 sessions, 623 messages, 1238 check-ins. North Texas-Oklahoma Traffic Net had 31 sessions, 282 messages, 949 check-ins. Transcontinental Phone Net reports: 1st Call Area 2065; Second Call Area 2002; 4th, 5th, 9th, 0th Call Areas, 527; total, 4594.

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National Traffic System. We have in our files, over a period of years, bulletins from nearly every NTS regional and area net, plus a great many NTS section net bulletins. Some are occasional, some regular. Among the regulars have been W4QDY's 4RN Bulletin. W1BVR comes out with a 1RN Bulletin when the occasion seems to warrant. Looking through our extensive regional and area net files, we find only three regional nets and one area net which have not put out bulletins of one kind or another within the last few years. Two of these regional nets and the one area net have their monthly activities summarized in independent traffic bulletins (Midwest Relay and/or PAN News), so actually only one of the regional nets has been bulletinless, although a couple have not issued a bulletin in two or three years. Significantly enough, those nets which have not issued any recent bulletins are the ones that are now the weakest links in the NTS chain — whether a cause or a result of their bulletinless status is not known, but we have a tendency to suspect the latter.

Of course regional and area nets have a different traffic mission from most traffic nets in that their function is representation rather than coverage, and their members are not individuals, but sections (in the case of regional nets) and regions (in the case of area nets). Nevertheless, most have found it practical to make up a mailing list of those amateurs who regularly represent their sections or regions. Add to this the list of SCMs, RMs, PAMs and maybe even SECs of the various sections covered and you not only maintain *esprit de corps*, but you tactfully but forcefully call to the attention of section leaders the shortcomings of their sections in the traffic handling field. It works! Try it and see.

October reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
1RN	31	721	.439	23.2	91.2[1]
2RN	59	641	.357	10.9	96.6
3RN	46	389	.323	8.5	79.0
4RN	53	725	.320	13.7	64.7
RN5	54	513	.253	9.5	96.3
RN6	61	785	.321	12.9	79.3
RN7	46	450	.256	9.8	32.6
8RN	49	213	.177	4.3	86.4
9RN	44	1240	.712	28.1	71.6
TEN	93	1033	.458	11.1	61.0
ECN	21	85	.170	4.0	82.5[1]
TWN	23	270	.226	11.7	72.2[1]
EAN	27	1416	.905	52.4	99.4
CAN	31	1388	.793	35.5	100.0
PAN	31	1279	.632	41.3	98.9
Sections[2]	882	7757	——	8.80	——
TCC East	78[3]	459			
TCC Central	62[3]	1002			
TCC Pacific	88[3]	950			
Total/ Summary	1551	21316	9RN/ EAN	12.2	——
Record	1386	18386	.928	12.3	100.0

[1] Regional Net representation based on one session per night. Other regional nets based on two or more sessions.

[2] Section nets reporting: Tenn. SSB, Tenn. CW; CN & CPN (Conn.); KPN, KYN, KPN Morning, KSN (Ky.) MSPN Evening, MSPN Noon, MJN, MSN (Minn.); VN (Va.); FMTN & Gator (Fla.); QKS (Kans.) AENB, AENP, AENP Morning, AENT (Ala.); WVN (W. Va.); SMN (Md.); GSPN (N. H.); S. Dak. CW, S. Dak. 75 Phone, S. Dak. 40 Phone; NJN (N. J.); SCN (Calif.); TLCN (Iowa); SCN (S. C.); HNN & CWXN (Colo.); GSN (Ga.)

We hate to keep mentioning this, but note that this month NTS again breaks all previous October records except the over-all average traffic per session and rate, and comes very close to beating them too. The almost-record-breaking average per session is especially significant, because this is a hard record to break when you consider that we have so many more sessions now than we had in October 1953 when this record was made. Thus, apparently we have not yet reached the NTS saturation point.

Several NTS regional and area nets have recently adopted a Sunday session, making their operation daily seven days per week. This makes eight out of 14 nets at NTS regional and area now operating seven days per week. We haven't yet made a tabulation of section net operating habits, but this would make an interesting study to determine whether or not NTS should now shift to a daily official schedule. The time is ripe, and this step has been urged by many NTSers. Of course some of the above daily schedules are on an experimental basis, but as of right now 1RN, 2RN, RN6, 9RN, TEN, EAN, CAN and PAN all operate daily. Regional nets 4, 5, 7, 8, and 11 (ECN) operate every day except Sunday; and only two RNs, 3RN and TWN, still stick to the five-day (Mon.-Fri.) schedule. By the time you read this, we hope to have completed a survey and made a decision one way or another.

K2RYH announces that 2RN went on daily schedule on October 16. Some signs of improvement are evident on 3RN as new E. Pa. RM W3AXA and W. Pa. SCM W3UHN swing into action. The following have received 4RN certificates during the past 12 months: *W4s* QDY BXV THM APM FDV, *K4s* DNW BVX JLO KDN AVU GAT JKK KNP ELG QES UBR. W5RCF commends Western Florida, which is now represented in RN5 nearly every session, often by two stations. K6HLR issues monthly RN6 Bulletins to all NCS, PAN liaisons, utility stations, managers of NCN, SCN and Nevada Net, PAS Chairman W6HC and the SCM of his section. W7GMC submits a report to make our roster at regional-area level complete, says he hates to see RN7 go unreported but not enough reports for a meaningful summary. W8DSX says 8RN is having difficulty with Saturday sessions and is not prepared for a Sunday Session at this time. ECN is starting a Saturday session and is planning to have the net represented on Sunday in EAN. TWN certificates have been issued to W7JBV, W0WME, *KØs* EDK and EDH. EAN adopted its daily schedule effective Nov. 2. CAN rolls along so smoothly that W9DO seldom has anything to say in his report, except "all is well." W6PLG is the new manager of PAN and has already taken over. K6DYX continued his stellar job right up to the end of October, including a fine wind-up bulletin summary of October operations.

Transcontinental Corps. W6BPT always gives us a rundown of the amount of traffic handled by each TCC function during the month. This is most informative and inter-

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for October traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W2KEB	288	1812	1432	286	3818
W3CUL	550	1291	1164	187	3192
WØBDR	44	1273	1161	11	2489
WØSCA	25	999	988	1	2013
W7BA	15	862	842	18	1737
W8UPH	14	687	640	44	1385
WØPZO	5	662	631	17	1315
WØIA	29	541	536	2	1108
W7PGY	29	539	510	24	1102
W9CXY	5	522	514	8	1049
K4SJH	138	462	396	23	1019
W1YBH	11	512	43	436	1002
W5RCF	16	488	470	18	992
W1UEQ	195	489	247	39	970
K6HLR	50	444	384	36	914
K6DYX	1	421	418	5	845
WØLGG	46	404	368	19	837
W1NJM	12	393	141	255	801
K6YBV	46	351	322	19	738
W6GYH	182	272	240	19	713
K1BCS	185	278	238	8	709
K2QBW	281	235	125	67	708
K4ELG	19	343	254	79	695
K4EZL	122	310	241	21	694
WØBLI	1	333	329	4	667
WØOHJ	7	333	312	11	663
K2OOK	125	305	209	18	657
K1CIF	55	309	281	11	656
K1AQB	19	313	312	1	645
K2SIL	43	300	291	4	638
W4AKC	69	284	244	32	629
WØTOL	42	310	227	10	589
W4RLG	24	265	276	22	587
WØCPI	2	282	259	23	566
W7ZB	12	273	255	18	558
W9ZYK	17	259	232	46	554
W1EMG	4	286	231	28	549
W1AWA	11	296	221	13	541
W7QLH	22	261	243	15	541
K4QIX	32	255	148	98	533
W9XZZ	172	174	0	174	520
K2GWN	46	256	211	4	517
W3UE	27	238	230	11	506
K5FJA	3	250	250	0	503
W5CEZ	20	244	220	18	502

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K5WSP	320	1134	998	56	2508
W1AW	19	1009	91	913	2032
K4WCZ	113	328	223	31	695
W6YDK	33	235	214	21	503
Late Reports:					
K6MCA (Sept.)	23	850	821	24	1718
K5FHU (Sept.)	87	330	347	18	782

BPL for 100 or more *originations-plus-deliveries*

K4GAT 212	K5OEA 118	W3TN 106	
W9IKY 209	K2VCO 116	K4LEM 106	
K9GDQ 158	W3CVE 115	KØGVS 105	
K2YBC 149	WØUOL 115	W1ZME 104	
K4HJK 139	W1TUW 114	W3BUD 103	
W4DAW 133	KØONK 114	K4KZP 103	
K4PJE 124	W9PCQ 113	K5IP8 102	
WØKJZ 124	K3WBJ 109		

More-Than-One-Operator Stations

WØDVL 145

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K1AQB, W4BZE, K5FHU.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

esting. We note that TCC station G handled the greatest amount of TCC traffic in October (38% of the total) and that traffic eastbound and westbound were about evenly divided, the latter being 52% of the total. October traffic was 22.3% over last month, but 14.4% under the April high.

October reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	76	98.7	1261	459
Central	62	100.0	1886	1002
Pacific	88	95.5	1876	950
Summary	226	98.2	5023	2411

The TCC roster: Central Area (WØBDR, Dir.) — WØBDR, WØSCA, W9CXY, WØLCX, WØLGG. Pacific Area (W6BPT, Dir.) — W5DWB, *W6s* ADB PLG BPT EOT VZT UTV HC ELQ ZRJ YHM, *K6s* DYX ORT EWY HLR GES GID, *W7s* VIU GMC ZB, WØKQD.

SUPPLEMENT TO NET DIRECTORY

The following listing will supplement and correct the listing on page 91, November *QST*. Please inform us promptly of any errors or omissions so that they can be included in the March *QST* installment. An asterisk (*) indicates correction from previous listing in November *QST*. This listing brings the record up to date as far as November 20, 1958. Registrations received after that date will appear in the March *QST* supplement.

Net registrations which do not show a traffic or emergency purpose are not being included in the net directory this season. Only nets which have been registered or reregistered subsequent to August 1, 1958, are included. This list does *not* include nets which were listed in November *QST* unless a change is shown.

Important Note: QST net listings are for *information only*. Insofar as possible, net information is listed exactly as received. Certain common abbreviations are used to conserve space. Listing in *QST* or the annual ARRL cross-indexed net directory does not signify necessarily that nets listed have any official status, does not entitle them to exclusive or prior right to the frequency or frequencies on which they are registered, and is in no sense a form of copyright.

Name of Net	*Freq.*	*Time*	*Days*
AENI Net (Ala.)	3885	1330 EST	Sun.
After School Net (ASN)	7105	1700 EST	Mon., Wed., Sat.
Akron Civil Defense and Disaster Net (Ohio)	51,000	1900 EST	Mon.
Ala. Emerg. Net P*	3955	1800 CST	Mon.-Sat.
		0800 CST	Sun.
		0630 CST	Mon.-Sat.
Ala. Emerg. Net "T" (AENT)	3905	1630 CST	Daily
All Service Net (ASN)	7270	1300 EST	Sun.
		1900 EST	Thu.
American Legion 2 Meter Net (ALN2) (Calif.)	146,570	1930 PST	Mon.-Fri.
American Legion Amateur Radio Net, Inc.	3975	1900 PST	Daily
American Red Cross Amateur Comm. Service Net (ARCACS) (Fla.)	29,600	2000 EST	3rd Mon.
Antietam Net (AN) (Md.)	3827	1900 EST	1/3 Tue.
Antilles Amateur Weather Net	3815	0700 AST	Daily
		1700 AST	
	7245		
Area D RACES Pomona, Calif. Area Net	28,660	0330 GMT	Mon.
	50,400		
	147,040		
	221,175		
A R C Net (Ashland, Richland, Crawford Cnty Net) (Ohio)	50,640	1900 EST	Wed.
Arkansas CW Net-OZK*	3790	1900 EST	Mon.-Sat.
Arkansas Emergency Phone Net NTS	3885	0600 CST	Mon.-Sat.
Arlington Emerg. Net (AEN)	7130	2000 EST	2/4 Sat.
Baldwin Park-West Covina C.D. Auxiliary Net (Calif.)	145,080	2100 PST	Sun.
Baltimore Emerg. Phone Net (BEPN)	3825	1830 EST	Mon., Wed., Fri., Sat., Sun.
	29,460		
Bedford CD and AREC Net (Mass.)	29,120	1900 EST	Mon.
Beehive Net (Section Phone Net) (Utah)	7272	1230 MST	Sun.
Birmingham Mobile Emerg. Net (BMEN)	29,560	1300 CST	Sun.
		1900 CST	Thu.
Blackstone Valley Radio Net	29,000	1900 EST	Mon.
Bloomfield Communications Group (BCG) (N. J.)	145,320	1900 EST	Tue., Fri.
Blue Ridge 160M Net (BRN) (Texas)	1815	0830 CST	Sun.
British Columbia AREC Net (BCAREC)	3755	1800 PST	Mon.-Sat.
Broome Co. AREC Net (N. Y.)	50,400	2100 EST	Fri.
Broward Emerg. Net (BEN) (Fla.)	29,400	1415 EST	Sun.
Bryan Co. AREC Net (Okla.)	7220	1400 CST	Sun.
Buzzards Bay, Cape Cod Islands Emerg. Net (Mass.)	145,260	1900 EST	Mon.
Calhoun Co. 6 Meter AREC Emerg. Net (Mich.)	50,700	1830 EST	Wed.
Calif. C.D. Net (CCDN)	3501	1930 PST	Mon.
		2000 PST	Tue.-Fri.
	7090		
Calumet Area Emerg. Net (CAEN)	1805	1900 CST	Mon.-Fri.
Cambria Co. C.D. Net (Pa.)*	29,470	2000 EST	Tue.
Capitol Area Radio Emerg. Net (CARE)	145,350	1500 EST	Sun.
Carbon Co. (Pa.) AREC Net	3840	0900 EST	Sat.
Carbon Co. (Pa.) RACES Net	145,380	2000 EST	Mon.
Catalpa Amateur Radio Society Net (CARS) (Mich.)	3970	0930 EST	Sun.
Central Able Net (Pa.)	3997	0800 EST	Sun.
Central Area Net (CAN)	3670	2030 CST	Daily
Central Fla. Operational Area C.D. Net*	145,200	0900 EST	Daily
Central Ill. Net (CIN)	1815	0830 CST	Sun.
Central Texas Emerg. Net (CENTEXEN)	3870	0830 CST	Sun.
Centre Co. C.D. RACES Net (Pa.)	28,570	2130 EST	Sun.
Chattanooga Amateur Radio Emerg. Net (CARE)	50,400	2030 EST	Sun.
Chicago FMN-1 AREC Net	147,500	2000 CST	Thu.
Chicago Six Meter RACES Net	50,540	2200 CST	Thu.
Chicago 2 Meter RACES Net	145,200	2000 CST	Thu.
Chittenden Co. Emerg. Net (CCEN) (Vt.)	29,568	1900 EST	Wed.
College Net	3905	1600 EST	Fri.
Colo Emerg. Fone Net (CEFN)	3890	0700 MST	Sun.
Colo Hi Noon Net (HNN)*	7240	1200 MST	Mon.-Sat.
Colo. Weather Net (CWXN)*	3945	0650 MST	Mon.-Sat.
Columbia River VHF Net	50,550	2000 PST	Thu.
Communications Club of New Rochelle, N. Y., Net	145,380	1930 EST	Mon.
Concord AREC Net (Mass.)	146,520	2100 EST	Mon.
Confederate Signal Corps, Inc. 6 Meter Amateur Radio Network	50,280	0800 EST	Sun.
Confederate Signal Corps "Two Meter" Net	145,350	2000 EST	Mon.
Conn. 6 Meter Phone Net (C6PN)	50,580	1945 EST	Mon.
Conn. VHF TFC & Emer. Net	145,980	2030 EST	M., W., F.
CQ Radio Club Net (Conn.)	146,900	1900 EST	Tue.
Cranston Civil Emerg. Net (R. I.)	29,510	2000 EST	Thu.
Cumberland Valley Amateur Radio Club Emerg. Net (Pa.)	29,400	2200 EST	Sun.
Dade Emerg. Net (DEN) (Fla.)	29,500	2000 EST	Mon.
	50,250	1930 EST	Mon.
Danvers Emerg. Net (DEN) (Mass.)	145,350	1845 EST	1st Mon.
Deep Sea Dragnet (DSD)	3970	1145 EST	Mon.-Sat.
Dixie Early Birds Net	7235	0530 CST	Mon.-Sat.
Dragnet	14,260	0915 EST	Mon.-Fri.
Du Page 6 Meter Emerg. Net (DP6MEN) (Ill.)	50,700	2130 CST	Fri.
Dutchess Co. (NY) RACES-6 Meter Net	50,380	2030 EST	Mon.
Dutchess Co. (NY) RACES-10 Meter Net	28,610	2000 EST	Mon.
Dutchess Co. (NY) RACES-2 Meter Net	145,350	2100 EST	Mon.

Dynamic Fone Net	7229.5	1445 EST	Mon., Wed., Fri.
East Able Net (Pa.)	3997	0830 EST	Sun.
East Coast Radioteletype Net (RTNET)*	3620	1900 EST	Wed.
Eastern Area Net (EAN)	3670	2030 EST	Mon.-Sat.
Eastern Mass Net (EMN)	3660	1300 EST 1900 EST	Mon.-Fri.
Eastern Mass 2 Meter Net	145,500	1945 EST	Mon.-Fril.
Eastern N. Y. AREC-10 Meter Net	29,490	2100 EST	Thu.
Eastern N. Y. AREC-2 Meter Net	145,350	2100 EST	Fri.
Eastern Penna. Net (EPA)*	3610	1830 EST	Mon.-Fri.
Eastern Sierra Net (ESN) (Calif.)	3925	1030 PST	Sun.
The EC (Echo Charley) Net (New Mex.)	3980	1900 MST	Sun.
Erie Co. Emerg. Net (N. Y.)*	3915	1230 EST	Sun.
Fairfax 75 Net	3845	1400 EST	Sun.
Fairfax 10 Net	28,720	0700 EST	Mon.
Fall River (Mass.) Emerg. Net (FREN)	29,200	1900 EST	Thu.
Finger Lakes Net (N. Y.)	145,350	2100 EST	Fri.
First Regional Net (1RN)*	3605	1930 EST	Daily
Florida Net (FN)*	3675	1900 EST	Mon.-Sat.
Foreign Legion Net	3904	0030 CST	Sun.
Forty RTTY Net (40 RTTY)	7140 21,090	1300 CST	Sun.
Four Corners U.S.A. Net	7225	1200 MST	Daily
Frisco Net	3810	0900 CST	Sat.
Fulton Co. (Ohio) Net	1821	2000 EST	Wed.
Galveston Co. RACES Net (Texas)	3993 50,560	1800 CST 0800 CST	Alt. Tue. Alt. Sun.
General Coverage Traffic and Emergency Net	3955	1600 EST 1000 EST	Daily Sun.
Genessee Co. Emerg. Net (Mich.)	29,480	2000 EST	Wed.
Ga. State Net (GSN)	3595	1900 EST	Mon.-Sat.
Golden Empire Amateur Radio Society Civil Emergency Net (Calif.)	1980	2000 PST	Mon.
The Graveyard Network	3885	0400 EST	Daily
Greater Long Island Net (GLI)	7060	2100 EST	Mon.-Sat.
Groveland (Mass.) RACES Net	146.875	1900 EST	Mon.
Gulf Coast Sideband Net	3925	1730 CST	Daily
Hair Pin Net	29,000	1300 EST	Tue.
Ham Butchers Net	7280	1220 CST	Mon., Tue., Thu., Fri.
Hamilton Co. Emerg. Net (Iowa)	1815	1830 CST	Daily
Hampton Roads Emerg. Net (Va.)	29,000	2000 EST	Mon.
Handycappers Phone Net	7280	0800 CST 0900 CST	Mon., Wed., Fri. Sat.
Harford Co. C.D. Radio Net (Md.)	29,590 145,680	1900 EST	Tue.
Hayseed Fone Net	3935	1700 CST	Tue., Thu., Sat.
Hiawatha Weather Net	3920	0730 EST	Mon.-Sat.
Houston Amateur Radio Club 6 Meter AREC Net	50,400	0900 CST	Sun.
Houston Amateur Radio Club Emergency Net	3995	0800 CST	Sun.
Huntsville Emerg. Net (AENS) (Ala.)	3825	1330 CST	Sun.
Ill. Emerg. Net Inc. (IEN)	3915	1730 CST 0800 CST	Tue., Thu. Sun.
Indiana Fone Net (IFN)	3910	1800 CST 0800 CST	Mon.-Fri. Daily
Indiana Side Band Net	3920	0730 EST	Daily
Ind. State CW Net (QIN)	3656	1900 CST	Daily
Inter-County Net (Fla.)	29,600	2000 EST	3rd Mon.
Inter-County Net (ICN) (Calif.)	221,500	2000 PST	Mon., Wed., Fri.
Interstate Sideband Net	3985	2000 EST	Daily
Iowa District Midwest Net (IDM)	7130	1730 CST	Mon.-Sat.
Iowa 160 Meter Network	1815	1900 CST	Daily
Jefferson Co. Six Meter Emerg. Net (AENX) (Ala.)	50,700	1915 CST	Tue.
Kankakee Amateur Radio Society Net (KARS) (Ill.)	3920	1200 CST	Daily
Keep Minn Green Net (KMG)	3810	1900 CST	Daily
Kennehoochee Emerg. and Traffic Net (Ga.)	29,460	2130 EST	Sun.
Kentucky Phone Net (KPN)	3960	0730 CST 1930 CST	Daily
Kentucky Sideband Net (KSN)	3975	1900 CST	Mon.-Fri.
Kentucky 6 Meter Net	50,570	1930 CST	Sun., Tue., Thu.
Kings Co. AREC CD 2 Meter Net (N. Y.)	145,260	2030 EST	Mon.
Kings Co. RACES-AREC 6 Meter Net (N. Y.)	50,400	2030 EST	Mon.
Kings Co. RACES-AREC 10 Meter Net (N. Y.)	29,640	2100 EST	1st Mon.
Knox Co. Emerg. Net (KEN) (Tenn.)	50,400	2000 EST	Thu.
Lakeland Slow Speed Net (LSS) (N. Y.)	3701	1600 EST	Daily
Lawrence Co. Net (Ohio)	3945	1830 EST	Tue.
Lebanon Co. Emerg. Net (Pa.)	146,800	2000 EST	Tue.
Los Angeles Amateur Radio Emerg. Council Net (LAAREC)	29,500	1215 PST	Mon.
Louisiana Net (LAN)	3615	1930 CST	Mon.-Fri.
Louisville Area Amateur Radio Emerg. Corps Net	29,500 53,600 147,300	1930 CST	Mon.
Mahoning Valley Emerg. Net (Ohio)	29,500 50,500	1900 EST	Mon.
Malden Emerg. Net (Mass.)	29,540	1930 EST	Mon.
Manchester (N. H.) Emerg. Net	29,000	1900 EST	Fri.
Marion Co. AREC Net (Ind.)	29,400 50,700	2000 EST	Tue.
Maritime AREC Net	3790	1730 AST	Wed.
Maritime Phone Net	3750	1900 AST	Daily
Md. Emerg. Phone Net	3820	1800 EST 1300 EST	M., W., F. Sat., Sun.
Mason Co. Red Cross Disaster Net (Mich.)	3920	2100 EST	Mon.
Mass. Phone Net (MPN)	3870	1800 EST	Daily
Memphis Six Meter Emerg. Net (Tenn.)	50,500	2000 CST	Mon.
Memphis Ten Meter Mobile Net (Tenn.)	29,627	1900 CST	Mon., Fri.
Memphis Two Meter FM Net	145,500	1930 CST	Mon.
Miami Co. Emerg. Net (Ohio)	1823	0930 EST	Sun.
Miami Valley C.D. Radio Nets (Dayton, Ohio)	50,400 157,150	2100 EST	Wed.
Mich. RACES 4th Area Net (EC-4)	3507.5	0830 EST	Sun.
Michigan Six Meter Net	50,250	2200 EST	Sun.
Middle Tenn. 6 Meter	50,600	1930 CST	Mon.
Military Civilian Affiliated Net 7 Mc. (MCAN7)	7215	0930 PST 1330 PST	Mon.-Fri.
Minnesota Jr. Net (MJN)	3690	1700 CST	Mon., Wed., Fri.
Minn. State Phone Net (MSPN)	3820	1800 CST	Mon.-Sat.
Minn. State Phone Net (Noon Section) (MSPN)	3820	1205 CST 0900 CST	Daily Sun., Hol
Missionary Communications Service	14,270	1230 CST	Mon.-Sat.
Missoula Area Emerg. Net (Mont.)	3890	0900 MST	Sun.
Mo. Emerg. (Phone) Net (MEN)	3885	1800 CST	Mon., Wed., Fri.
Mo. 160 Mtr Emerg. & Traffic Net	1820	2000 CST	Mon., Tue., Fri.
Missouri Traffic Net (MON)	3580	0700 CST 1900 CST	Mon.-Sat.
Montana Phone Net	3910	1800 MST	Mon., Wed., Fri.
Monterey Bay Radio Club Emerg. Net (Calif.)	147,160	2000 PST	Mon.
Montgomery Co. Ill. CD Net	50,500	2000 CST	Tue.
Montgomery Co. Operational Net (Pa.)	29,520	2000 EST	Thu.
Morning Ky. Phone Net	3960	0730 CST 0800 CST	Mon.-Sat. Sun.
Mosquito Net (MN)	29,000	2130 EST	Tue.
Mt. Diablo Amateur Radio Club Net	50,680 145,290	1915 PST 1900 PST	Mon. Mon.
Muskeg Net	3755	1915 EST	Mon.-Fri.
Muskegon Co. C.D. and Red Cross Amateur Radio Network	29,610	2100 EST	Tue., Fri.

Muskigum Amateur Radio Assn. Emergency Net (Ohio)	29,616	2200 EST	Fri.
Nashville, Davidson Co. 6 Meter Emerg. Net (Tenn.)	50,600	1930 CST	Mon.
Nebr. 75 Meter Emerg. Phone Net (NEPN)	3983	1230 CST	Daily
Nebraska 75 Meter Morning Phone Net	3980	0730 CST	Daily
Nebr. Slow Speed Net (NSS)	3750	1700 CST	Daily
Nemasket Net (Mass.)	28,712	1000 EST	Sun.
New England Emerg. Phone Net	3870	0900 EST	Sun.
N. H. CW Traffic Net (NHN)*	3685	1845 EST	Mon.-Fri.
N. J. C. D. Net (CW) (CDNJ)	3505.5	1015 EST	Sun.
N. J. C. D. Net (Phone) (NJ-2)	3993	0930 EST	Sun.
N. J. 6 Tfc & Emerg. Net	51,000	2300 EST	Wed., Sat.
N. J. Slow Speed Net (NJSS)	3748	1830 EST	Mon.-Fri.
New Mexico Breakfast Club	3838	0700 MST	Mon.-Sat.
N. M. Emerg. Phone Net (NMEPN)	3838	0730 MST 1800 MST	Sun. Tue., Thu.
New Smyrna Beach Hurricane Net (Fla.)	29,000	1030 EST	Sun.
N. Y. C.-L. I. Phone Net (NYC-LIPN)	3908	1730 EST	Mon.-Sat.
N. Y. C.-L. I. VHF Traffic Net	145,800	2000 EST	Tue., Wed., Thu.
N. Y. State CD Net	3509.5 3993	0900 EST	Sun.
N. Y. State CW Traffic Net (NYS)	3615	1900 EST	Daily
N. Y. State Phone Traffic and Emergency Net (NYP)*	1925	1800 EST	Daily
Newfoundland CD Net	7210	1600 NST	Sun.
Newfoundland Net	3750	1900 NST	Daily
Nishna Valley 6 Meter Net (Iowa)	51,150	0800 CST	Sun.
North Dakota CW Net	3670	1830 CST	Mon., Wed., Fri.
N. Dak. 75 Meter Phone Net	3845	1800 CST	Mon.-Sat.
North Hills Radio Club Net	51,300	2100 PST	Wed.
North Texas CW Net (NTX)	3770	1700 CST	Mon.-Sat.
North Texas Emerg. Net (NTEN)	3930	0800 CST	Sun.
N. Texas-Okla. Traffic Net (NTO)	3960	1730 CST	Daily
N. W. Texas Emerg. Net (NWTEN)*	3950	0800 CST	Sun.
Northeast Area Barnyard Net	3960	0800 EST	Mon.-Sat.
Northern Va. Emerg. Net (NORVA)	29,480	2000 EST	1-3 Fri.
Northwest Fla. Net (NWFN)	3650	1730 CST	Mon.-Sat.
Northwest Slow-Speed Net (NSN)	3700	2100 PST	Mon.-Sat.
Novice Hurricane Net (Fla.) (NHN)	3725	0730 EST	Sun.
Nutley Amateur Net (N. J.)	29,400	1330 EST	Sun.
Oak Ridge Emerg. Net* (Tenn.)	50,700	1900 EST	Mon.-Fri.
O. A. R. S. Net (Oregonian Amateur Radio Society net)	29,200	1930 PST	Daily
Observation Information Command Net (N. C.)	3895	1900 EST	Fri.
The Ohio Mich. Ind. & Ky. Electronic & Communications Ass'n. Net	3820	0700 EST	Sun.
Ohio Slow Speed Net (OSN)	3580	1830 EST	Mon.-Sat.
Okla. Emerg. Phone Net (OPEN)	3860	0800 CST	Sun.
Okla. Slow Speed Net (SSZ)	3682.5	2130 CST	Mon.-Sat.
Oklahoma Traffic Net (OLZ)	3682.5	1900 CST	Mon.-Sat.
160 Meter Screwball Net	1992	1230 CST	Mon.-Sat.
Ontario Fone Net (OFN)	3770	1900 EST	Mon.-Sat.
Orange Co. Emerg. Net	50,800	1900 CST	Daily
Oregon Emergency Net (OEN)	3840	1800 PST 1900 PST	Daily
Oswego Co. C. D. Net (N. Y.)	147,150	1900 EST	Sat.
Panhandle Weather Net	3940	1730 CST	Daily
Penna. CW CD Net	3503.5	0900 EST	Sun.
Penna. Phone Net (PFN)	3850	1800 EST	Mon.-Fri.
Phil-Mont Mobile Net ("10 on 10") (Pa.)	29,493	0700 EST	Daily
Polk Co. AREC Net (Fla.)	29,600 50,170 145,210	1930 EST	Wed.
Pony Express Net	3920	0830 MST	Sun.
Porter Co. Emerg. Net (Ind.)	145,800	1930 CST	Mon.
Portland CD Net (Ore.)	50,550	2100 PST	Thu.
Post Road Emerg. Net (Mass.)	29,480	1900 EST	Mon.
Potomac-Rappahannock Valley Net (PRVN)	3935	0900 EST	1/3 Sun.
P. R. Amateur Emerg. Net	3925 7245	2000 AST	Wed.
Putnam Co. A. R. E. C. Net (Conn.)	3890	1330 EST	Sun.
Queen City Emerg. Net (QCEN)	29,600 50,700	2000 EST 2000 EST	Mon. Wed.
Queens Co. 10 Meter CD-AREC Net (N. Y.)	29,500	2000 EST	Mon.
RACES District 4 Phone Net (BF) (Vt.)	50,360 147,300	0900 EST 2000 EST	Sun. Thu.
Randolph C.D. Net (Mass.)	29,530 145,700	1930 EST	Mon.
The Red Rocks Amateur Radio Club Net (TRRARCN)	7250	2100 MST	Sat.
R. I. State Phone Net	3915	1830 EST	Tue., Thu., Sat., Sun.
R. I. Traffic Net (RIN)	3540	1900 EST	Mon.-Fri.
Richland Co. Emerg. Net (Ohio)	145,350	2030 EST	Thu.
Rock Island Co. RACES Net (Ill.)	29,500 50,580	2030 CST 1930 CST	Sun. Fri.
Rockbridge Amateur Emerg. Net (RAEN) (Va.)	50,400	0630 CST	Tue., Thu.
Rockford 6 Meter Emerg. Net (Ill.)	50,400	2100 CST	Wed., Thu.
Rockland Co. AREC Net (N. Y.)	29,600	1930 EST	Wed.
Rutland City CD Phone Net (Vt.)	145,530	1900 EST	Tue.
Sacto Am CD Emer Comm System (Calif.)	3885 51,300 147,120	2000 PST 1930 PST	Tue.
San Angelo 10M Emerg. Net (Texas)	29,188	2000 CST	Mon.
San Bernardino Area Net (AREC)	29,200	1900 PST	Mon.
San Joaquin Co. 2 Meter Emerg. Net (Calif.)	146,800	2000 PST	Tue.
Santa Barbara AREC Net (Calif.)	29,550	1900 PST	Mon.
Sask. ARRL Phone Net	3780	1830 MST	Daily
Satsuma Valley Emerg. Net	3845	1815 CST	Wed.
Schenectady Emerg. Communications Net (S.E.C.) (N. Y.)	3950	1400 EST	Sun.
Second Regional Net (2RN)	3690	1845 EST 1945 EST	Daily
Sector 2-D Stoughton, Mass. Net	29,490	1930 EST	Mon.
Seventh Regional Net (RN7)	3575	1945 PST 2130 PST	Mon.-Sat.
Seymour Amateur Radio Net (SARC) (Ind.)	3750	1900 CST	Sun.
Show-Me Net (SMN) (Mo.)	3580	1600 CST	Sun.
Single Side Band Net (Pa.)	3997	0930 EST	Sun.
Sioux Falls C.D. Net (S. D.)	144,900	2100 CST	Sun.-Wed.
Six Meter Club Net (Ill.)	50,400	2200 CST	Tue.
Six Meter Nomad Net	50,400	2000 EST	Mon.
Sixth Regional Net (RN6)	3615	1945 PST 2130 PST	Daily
SKETO Net (Calif.)	3910	2000 PST	M., W., F.
Sooner Traffic Net (STN)	3850	1800 CST	Mon.-Sat.
Sourdough Net (Alaska)	3892	1900 AST	Mon.-Fri.
S. C. Phone Net (SCFN)*	3930	1930 EST 0830 EST 1530 EST	Mon.-Fri. Sun.
S. Dak. CW Net (SDN)	3645	1900 CST	Mon., Wed., Fri.
S. Dak "inter-state" 40 meter ("emergency") phone sent	7225	1215 CST	Mon.-Sat.
S. Dak. 75 meter ("emergency") phone net	3870	1830 CST 0930 CST	Daily Sun.
S. Dak. SSB Net	3870	2000 CST	Mon.-Sat.
So. Dak. Weather Net	3870	0700 MST	Mon.-Sat.
South East Emerg. Net	29,500	2030 EST	Mon.
South Texas Emergency Net	3890	1815 CST	Mon.
So. Texas Emerg. Net (CW)	3780	1930 CST	Mon.
S. Tex. Emerg. Net SSB Section 80 Meters	3860	2000 CST	Wed.
S. Tex. Emerg. Net SSB Section 40 Meters	7215	2000 CST	Mon.

S. Tex. Emerg. Net (Zone 5) (STEN)	3815 3860	1900 CST 1815 CST	Tue. Mon.
Southern Alameda Co. Emerg. Net (SACEN) (Calif.)	3980	2100 PST	Sun.
Southern Calif. Net (SCN)*	3600	1900 PST	Mon.-Fri.
Southtown AREC & RACES Net (Ill.)	29,640	1930 CST	Mon.
Southwest La. Emerg. Net	3850	1400 CST	Sun.
Spokane A.R.E.C. Net (Wash.)	29,600	1930 PST	Tue.
St. Clair City Emerg. Net (Mich.)	29,590	2000 EST	Mon.
State of Vt. CD RACES CW Net (VT-1)	3501.5	1000 EST	Sun.
State of Vt. CD RACES Phone Net	3993	1000 EST	Sun.
State Radio Officers Command Net (Pa.)	3997	0745 EST	Sun.
Story Co. Novice Net (Iowa)	3708	1800 CST	Sat.
Sundown Novice Net (SNN)	7152	1800 CST	Sat., Sun.
Sundown Traffic Net (STN)	7145	1730 CST	Daily
SW Michigan Two Meter Net	145,260	2000 EST	Mon.
Tar Heel Emerg. Net. N. C.	3865	1930 EST	Mon.-Fri.
Tarrant Co. Disaster Control Net (TCDCN) (Texas)	3970	1300 CST	Sun.
10 Meter AREC Net (Calif.)	29,560	1900 PST	Tue.
Tenn. 75 Meter Phone Net	3980	0645 CST 1806 CST 0800 CST	Mon.-Sat. Tue., Thu. Sun.
Tenn. Side Band Net	3980	1960 EST	M., W., F.
Tenn. Six Meter Emerg. Net	50,500	1930 EST	Mon.-Fri.
Tenn. Valley Emerg. Net (AENR) (Ala.)	50,550	1900 CST	Tue.-Thu.
Topeka Kans. Ten Meter Emerg. Phone Net	29,600	0900 CST	Sun.
Traffic Hounds Morning Watch (MW)	7080	0645 EST	Mon.-Sat.
Trans Continental Relay Net (TCRN)	3521 7042	2300 GMT 0615 GMT 0215 GMT 1600 GMT	Daily
Tri-County Net (TCN) (Calif.)	3820	1200 PST	Mon.-Fri.
Tri State Six Meter Net	50,560	0800 CST	Sun.
Trumbull Co. Emerg. Net (Ohio)	29,604	1845 EST	Tue.
Tulare Co Net (Calif.)	3960	1000 PST	Sun.
Tularosa Basin Two Meter Phone Net (N. M.)	146,166	1800 MST	Mon.
Twelfth Regional Net (TWN)*	3570	1900 MST	Mon.-Fri.
2-4-6 Net (Calif.)	50,100 145,080	1900 PST 1900 PST	Mon.-Fri. Daily
Ulster-Kingston CD RACES Net (N. Y.)	29,510 145,440	2000 EST	Mon.
Union Co., N. J. Amateur Radio Emerg. Corps Net	146,940	2000 EST	Tue.
United Trunk Lines (Eastern Section) (UTL*)	3565	2100 EST	Daily
Univ. of Conn. Emerg. Net	3825	1900 EST	Daily
Upper Mich. Emerg. Net (UPEN)	3920	0900 EST	Sun.
UTL — West (United Trunk Lines) (UTL)	3565	1930 PST	Daily
Virginia Phone Net (VFN)	3835	1900 EST	Daily
Virginia Slow Net (VSN)	3680	1830 EST	Mon.-Fri.
Walpole Emerg. Net (Mass.)	145,275	1900 EST	Mon.
Waltham CD Net (Mass.)	146,800	1930 EST	Mon.
Warren Co. RACES Net (Ill.)	50,550 53,700	1830 CST	Wed.
Washington Amateur Radio Traffic System (WARTS)	3970	1800 PST	Mon.-Sat.
Washtenaw Co. C.D. Net (Mich.)	145,260	2030 EST	Tue.
Waukesha Co. CD Net (Wis.)	145,290	2000 CST	Mon.
Weber Co. C.D. Net (Utah)	29,510 145,350	2000 MST 2000 MST	Thu. Mon.
West Able Net (Pa.)	3997	0900 EST	Sun.
West Baker Net (Pa.)	29,490	0830 EST	Sun.
West Marva Net	50,700	1245 EST	Sun.
Western N. C. 6-meter Net	51,000	1900 EST	Tue., Thu.
Western Pa. Mobileers Net	29,360	2000 EST	Wed.
Western Pa. ORS Traffic Net	3585	1900 EST	Mon.-Fri.
Westmoreland Co. CD Net (Pa.)	29,500	2100 EST	Tue.
Westside Amateur Radio Club Emerg. Net (La.)	28,900	2000 CST	Mon.
Weymouth C.D. Net (Mass.)	28,580 53,670 147,186	1100 EST	Sun.
Wheat Belt (10 Meter) Net (Sask.)	28,200	2000 MST	Tue.
Whittier (Calif.) Emerg. Net	3885	2015 PST	Thu.
The Wilkinsburg Emerg. Net (Pa.)	51,000	1800 EST	Tue.-Sun.
Winchester CD Net (Mass.)	147,090	1945 EST	Wed.
Winthrop Emerg. Radio Net (Mass.)	147,250	1830 EST	Alt. Mon.
Wis. Slow Speed Net (WSSN)	3620	1836 CST	Mon.-Fri.
Wis. Traffic Net (WTN)	51,100	2000 CST	Mon.
Wood-Ridge, N. J. C.D. Net	145,680	2000 EST	Wed.
Wyo. Jackalope Net	7255	1200 MST	Mon.-Fri.
YO Net (Wyo.)	3610	1830 MST	Mon., Wed., Fri.

RTTY NOTES

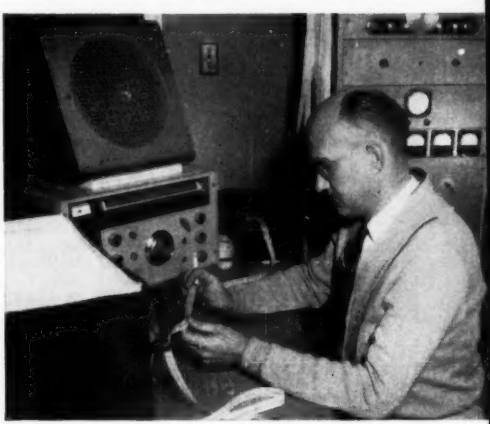
Results of the RTTY Sweepstakes of October 31 and November 1 have been received from W6AEE of the RTTY Society of Southern California. VE7KX was top scorer with 9212 points and also had the leading section multiplier of 49. W2RUI and WØBP made 100 QSOs apiece but W2RUI's slightly higher multiplier enabled him top "Beep" 7600 to 7326 points. The figures after each call in the listing show score, number of QSOs, and number of different ARRL Sections worked.

VE7KX	9212- 94-49	W6GDO	3348- 62-27
W2RUI	7600-100-38	W6MTJ	2850- 57-25
WØBP	7326-100-37	W6CG	2340- 45-25
W2JAV	5780- 85-34	W7LPM	2268- 54-21
W2TKO	5600- 80-35	W6AEE	2250- 45-25
K4RRG	5120- 80-32	KL7MZ	2080- 42-26
W6FYM	4466- 77-29	W6JCK	2040- 40-23
KH6IJ	4050- 75-27	WØFQW	1512- 36-21
W9ROQ	3840- 60-32	W1BDI	1496- 34-22
W5YM	3720- 60-31	W6ZBV	1258- 37-17
W3PYW	3510- 68-26		

Another 44 amateurs reported scores of less than 1000.

The 6th Anniversary RTTY SS will be coming up February 13 and 14, and an informal short-shift contest, in which 170 c.p.s. is preferred, is scheduled for March 13–15. Further details next month.

Teletype enthusiast VE7KX did right well in the fall RTTY SS (see standings above) with four separate rigs, finals featuring an 833 on 3.5, 6C21 on 7, p.p. 450TLs on 14/21, and a 2E26 on 144 Mc. RTTY gear includes a Model 26 page printer, Model 31 narrow tape printer, W2JAV converter, Model 1A tape head feeding 16-tube multibrator-type electronic distributor, keyboard perforator, Model 14 nontyping reperf. Formerly VE5HP, VE7HP and VE8DX, Jim is currently B.C. Section Emergency Coordinator, a director of the British Columbia Amateur Radio Association and Vancouver Amateur Radio Club President.



W1AW OPERATING SCHEDULE

RESULTS, SEPTEMBER FREQUENCY

Md.-Del.-D. C. OO/OES W3MSR, ex-W9WJV, slammed out 237,600 points for third position in the October CD. A Potomac Valley Radio Club contest expert, Larry also paced one-operator (Class B) portables in the last two Field Days, has been running up fine totals in recent v.h.f contests. His latest claim to fame: 1160 QSOs in the 1958 Sweepstakes for deah ole PVRC.

RESULTS, OCTOBER CD PARTIES

Those who have been in CD Parties for a while have seen interest skyrocket in the quarterly on-the-air get-togethers, open to ARRL appointees and officials. Not long ago a score of 100,000 or a section mutliplier of 60 was almost unheard of. With summer over and weather and band conditions ideal for hamming, activity peaks in the October holding, traditionally the best of the lot. To prove that business is booming, we present this comparison of two fall c.w. parties a half-decade apart.

	October 1953	*October 1958*
Number of scores over 100,000	3	52
Number of scores over 50,000	32	113
60 or more sections worked	0	47
55 or more sections worked	1	69
Stations with 500 or more QSOs	1	19
Stations with 400 or more QSOs	2	38
Most sections worked by any stn.	59	69
Top ten: average number of QSOs	341	653
Leading score	161,660	285,425
Top W1/W2/W3 score	121,000	262,820
Top W4 score	161,660	285,425
Top W5 score	95,665	130,800
Top W6/W7 score	71,834	205,690
Top W8/W9/WØ score	109,080	212,190
Top Canadian score	30,660	155,610
Average of top ten scores	95,017	216,205

Stupendous, eh? Up everywhere. Yet there is time to handle traffic, to call someone by name, to swap conversation for a moment. As one fan put it a while back: "The parties offer a competitive incentive to excel without sacrificing fraternal advantages — a snappy pace, but always time to enjoy a chat with an old friend. . . . A privilege to spend the week end with such a fine bunch of ops."

As the above statistics indicate, the October, 1958 c.w. party was marked by a number of outstanding performances. Chief among them was W4KFC's crunching 285,425-pointer and new record of 848 contacts, latter representing a bristling 47-per-hour average. Said Vic, Roanoke Asst. Director: "Twenty, 40 and 80 jumped for joy the whole period, while ten and 15 yielded a bumper crop of CD contacts. What a ball!" ORS W1EOB (another Vic, by the way), OO/OES W3MSR, SCM W1TYQ, Asst. Dir. W9RQM and OO W6ZVQ also cracked 200K but it remained for ORS K6QHC, missing only Louisiana, N. C., West Indies and Yukon, to pace the pack in different sections worked. W1EOB got the second high multiplier of 68, couldn't locate Montana, KZ5, VE4, VE5 and that old bugaboo Yukon, where QSL Manager VE8AW reigns as the lone appointee. U. S. call area leaders scorewise were W1EOB, ORS K2SIL, W3MSR, W4KFC, RM K5BSZ, W6ZVQ, OBS W7RGL, RM W8PBO, W9RQM, and RM KØCNC in rare North Dakota. OES KL7CDF, ex-W9KLD, who has made Alaska very available in recent parties, topped the Possessions, while the Dominion was ably represented by RM VE3BZB with 155K, also SCM VE2DR, ORS VE2CP, and ORS VE7AC. Two questions: (1) Who will be first to rack 1000 QSOs?; (2) Who will be first to land all 73 sections?

Phone participation has grown by leaps and bounds too, but the party of October 25 and 26 dipped downward. Probable causes: (1) Everyone was resting up from the record-smashing code sport the previous week end; (2) Everyone was resting up for the Sweepstakes soon to follow; (3) Another outfit was running a worldwide DX contest the same dates. Anyhow, Oneland starred in the microphone bit, what with eight of the 17 top scorers being there. OO/OBS/OPS W1FYF led on score and sections-worked counts. Place position and honors for the number-one contact figure of 149 went to W1DGL, OPS/ORS of West Mass., as OPS K3ANS rounded out the big three, and ORS K4QIX, OPS K1CAU, OPS W2COB, ORS/OES W8NOH, OPS W1GKJ, OO W1VW and OO/OES W3MSR also cracked 10,000 points.

All c.w. scores above 50,000 and phones above 5000 follow, the figures showing claimed points, QSOs, and sections contacted. Final and complete results appear in the January CD Bulletin.

C.W.

W4KFC	285,425-848-67	KØIDV	116,870-399-58
W1EOB	262,820-766-68	W8PBO	108,750-371-58
W3MSR	237,600-713-66	K5JCC	108,275-350-61
W1TYQ	224,450-663-67	W4FFF	107,415-334-63
W9RQM	212,190-637-66	W1DZV	106,800-350-60
W6ZVQ	205,690-610-67	K2BHQ	106,140-361-58
W1RAN	190,400-589-64	K6ORT	105,400-333-62
K4CAX	182,400-602-60	W4SNH	105,000-370-56
W1MX [1]	181,350-551-65	WØBDR	104,595-367-57
K4BAI	179,725-547-65	VE2DR	104,410-388-53
K4LPW	179,235-562-63	K2QBW	101,185-336-59
W1AW [2]	171,045-536-63	W2MUM	99,850-316-62
W3KLA	170,495-559-61	K2MFF	96,880-340-56
W1PUO [3]	168,020-535-62	W7RGL	93,330-299-61
K2SIL	166,080-513-64	K2RYH	92,055-355-51
W6WNI	165,425-502-65	W9LNQ	89,400-293-60
W3YA [4]	162,870-534-61	W8SVL	88,350-306-57
W3NF	160,430-519-61	W3EEB	88,145-284-61
VE3BZB	155,610-490-63	W9CBE	87,715-324-53
K9ALP	155,105-463-67	W1SMO	86,060-325-52
W2AYJ	155,000-493-62	VE2CP	85,960-300-56
K2PHF	154,635-500-61	K2QZS	84,150-327-51
W2FEB	151,830-478-63	W5FCX	84,000-279-60
K9ELT	151,280-484-62	WØIA	83,700-270-62
K2EIU	148,500-489-60	W1KGJ	82,420-311-52
W3WJD	146,940-469-62	K9DWK	81,225-281-57
W9JJN	146,900-453-63	K4HOU	81,120-306-52
K6QHC	143,865-437-69	K9GSG [5]	80,370-279-57
W9YYG	143,325-436-65	W9MAK	80,025-284-55
W6ISQ	140,250-418-66	W2SZ [6]	79,515-273-57
W3KUN	137,100-450-60	W1MTX	79,250-312-50
K5BSZ	130,800-431-60	W1CMH	77,805-267-57
W3ZHQ	130,210-444-58	W7GHT	77,000-274-55
KØCNC	128,405-415-61	W2MTA	74,970-301-49
KL7CDF	127,410-405-62	K2KNV	74,165-275-53
W3GYP	126,555-424-59	W1HKA	73,920-260-56
W2DRV	125,670-419-59	K3CIO	73,815-254-57
W1TS	125,550-398-62	W3LXU	73,060-274-52
K2AFQ	120,655-403-59	K4ELG	71,285-263-53
W1AQE	118,800-396-60	K4OYR	70,800-233-59
W2ANG	118,340-383-61	VE7AC	70,180-237-58

Also over 50,000 were K8EUC 69,255, W8IBX 68,685, WØBLZ 68,145, W9PCQ 66,690, W7JC 66,640, W1MIX 65,780, K4QES 65,070, W1MEL 64,605, W9VAY 62,230, WØWYJ 60,270, W4VQZ/1 [8] 60,160, W1GKJ 60,000, K4UBR/4 59,940, K8HID 59,535, K5MBB 58,575, W6YCF 55,825, W3KJJ 55,335, W3ADE 55,120, W3GJY 54,720, WSNOH 52,725, K2VUI 52,185, W4JUJ 52,080, W2DUS 51,510, K9AUE 51,000, W2LRO 50,625, K4DRO 50,600, W3ZSX 50,400, W2ZEP 50,055, K1AJJ 50,020, K2MMM 50,000, W9FDL 50,000.

PHONE

W1FYF	22,240-139-32	W1VW	10,810- 90-23
W1DGL	20,020-149-26	W3MSR	10,670- 90-22
K3ANS	15,080-112-26	K4BAI	9380- 61-28
K4QIX	14,935-100-29	W3NF	8470- 70-22
K1CAU	14,820-110-26	K9ALP	7540- 58-26
W2COB	12,500-100-25	K1DJG	6545- 71-17
WSNOH	12,000- 75-30	KØIDV	5525- 61-17
W1GKJ	10,925- 90-23	K1BC [8]	5040- 57-16
		W1KGJ	5005- 71-13

[1] K2KIR, opr. [2] W1WPR, opr. [3] W1WEF, opr. [4] W3YOZ, opr. [5] Multioperator station. [6] K2RRH, opr.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

With reference to the DXCC Note appearing in the July

It is requested that none of the above confirmations be

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(All times given are Eastern Standard Time)

W1AW returned to its Fall-Winter operating schedule with the return to Standard Time. General operation covers all amateur bands on which W1AW has equipment. Novice periods include operation on 3.5, 7 and 21 Mc. (see footnote 2 in box on p. 89, November *QST*). Master schedules showing complete W1AW operation in EST, CST or PST will be sent to anyone on request.

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General Operation: Use the chart (p. 89, November *QST*) for determining times during which W1AW engages in general operation on various frequencies, phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous days in western time zones. W1AW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

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Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
K4HTO	0.0	W8GQ	0.0
W4JUI	0.0	W8HB	0.1
W7PQJ	0.0	W6WKO	0.2
W8CUJ	0.0	W1PLJ	0.3
W8YCP	0.1	W5NKH	1.8
W4CVO	0.3	K6HI	2.2
W1MUN	0.5	W1NNX	4.9
W9VZF	0.5	W8YPT	5.2
W9TZN	0.7	Leroy Whittle	5.4
W8GBF	0.9	W2BJP	5.5
W2AIQ	1.3	K4MEZ	6.0
W1BKG	1.9	K6ZCR	6.0
W3LJV	3.2	K4UYY	6.1
W1QHS	4.4	K8CXI	6.9
W2QYT	5.9	W5JPM	7.1

A.R.R.L. ACTIVITIES CALENDAR

Jan. 8: CP Qualifying Run — W6OWP
Jan. 10–11: V.H.F. Sweepstakes
Jan. 17–18: CD Party (c.w.)
Jan. 21: CP Qualifying Run — W1AW
Jan. 24–25: CD Party (phone)
Jan. 31–Feb. 15: Novice Roundup
Feb. 1: CP Qualifying Run — W6OWP
Feb. 6–8: DX Competition (phone)
Feb. 13: Frequency Measuring Test
Feb. 19: CP Qualifying Run — W1AW
Feb. 20–22: DX Competition (c.w.)
Mar. 5: CP Qualifying Run — W6OWP
Mar. 6–8: DX Competition (phone)
Mar. 19: CP Qualifying Run — W1AW
Mar. 20–22: DX Competition (c.w.)
Apr. 1: CP Qualifying Run — W6OWP
Apr. 11–12: CD Party (c.w.)
June 27–28: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Jan. 9–11: WAE DX Contest (c.w.), DARC (p. 75, this issue).

Jan. 24–25: VE1 Contest, New Brunswick Amateur Radio Assn. (p. 152, this issue).

DXCC Notes

Announcement is hereby made of the addition to the ARRL Countries List of the Republic of Guinea. Formally counted as a part of French West Africa, this country will be considered as separate from French West Africa as of October 1, 1958. DXCC credit will be given starting March 1, 1959 for creditable confirmations dated on or after October 1, 1958 for this country.

Announcement also is made of the addition to the ARRL Countries List of Manihiki Islands. Sometimes called Northern Cook Islands, this group has formerly been considered as with the Cook Islands. The main islands in this group include Manihiki, Danger Island (Pukapuka), Tongareva and Rakahanga. DXCC credit for this country will be given starting March 1, 1959 for creditable confirmations dated on or after November 15, 1945.

With reference to the DXCC Note appearing in the July 1958 issue concerning ZL1ABZ confirmations, we are pleased to announce that *all* creditable confirmations for contacts made with ZL1ABZ dated on or after September 27, 1958 will be accepted for DXCC credit.

It is requested that none of the above confirmations be submitted for credit before March 1, 1959. This is to permit foreign amateurs to start receiving credits at the same time as those in the U. S. A. Confirmations received prior to March 1, 1959 will be returned without credit.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....289
W6AM.....287
ZL2GX.....287
KV4AA.....283
PY2CK.....284
W3GHD.....283
W8HGN.....282
W8JIN.....282
W8JNN.....282
W8BRA.....281
W6BYG.....281
W2HXA.....281
W5AS8G.....281
G3AAM.....280
W2AGW.....280
W2HUQ.....279
W3KT.....279
W1ME.....279
G2PL.....279
W8DMD.....279
W8NBK.....278
ZL1HY.....278
W6CUQ.....278
W6DZZ.....278

Radiotelephone

PY2CK.....284
W8GZ.....276
W1FH.....276
VQ4ERR.....274
Z86BW.....274
W3MJN.....271
W8BF.....268
W8HGW.....267
ZL1HY.....267
W9RBI.....264
CN8MM.....264
CX2CO.....263
W8KML.....263
W6AM.....262
ZL2GX.....259

From October 1, to November 1, 1958 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

G3FUR.....157
G3DQC.....147
W8SZS.....140
W1CBZ.....136
W7HDL.....131
W9LTR.....130
ZE1JV.....128
KP4ADS.....119
PAØGER.....119
VQ3CF.....116
W6HAL.....113
K2UPD.....112
ZP9AY.....111
ZS6IF.....110
W4PLL.....109
K6RTK.....108
W8WBU.....108
W9MBF.....108
WØDVZ.....107
K6KII.....106
WØETV.....106
WØLPA.....106
WØTGQ.....106
OZ3GW.....106
SM6BDS.....106
W2EHN.....105
W4SHX.....105
OE6FD.....105
UO5AA.....105
YU3OV.....105
ZE6JL.....105
W2QDY.....104
W6JEV.....104
PY4ZI.....104
VP6LT.....104
W2WMG.....103
OE6BN.....103
ZL4MK.....103
W1FQA.....102
F9YZ.....102
FL8AB.....102
G3JZK.....102
VE8OW.....102
ZS1KO.....102
K2IAD.....101
DJ2CP.....101
W1BGH.....100
W4Y8Y.....100
K6AUC.....100
W7OEB.....100
W7RYS.....100
W7VOL.....100
W9KXZ.....100
WØSLB.....100
DJ1WT.....100
OK2UD.....100
PY1BDU.....100

Radiotelephone

CE2CC.....212
W2KUW.....152
PAØCT.....131
W3FWD.....130
W3ICQ.....124
ZL3PJ.....122
W3HCO.....121
W8YBZ.....120
G8TS.....115
W6BAF.....112
G3JNX.....110
G3AKX.....107
W5LTY.....106
W9MWO.....106
W8SZS.....105
K5JEA.....104
VK4EL.....104
W2DEW.....103
KØABH.....103
DJ2DW.....103
KR6RB.....102
G3DQC.....101
KP4GN.....101
YU3JN.....101
W1QFQ.....100
W3ABW.....100
W4Y8Y.....100
PY5QZ.....100
ZS1KO.....100

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W9LNM.....271
W7GBW.....271
W1GKK.....270
W3GAU.....270
W6NNV.....270
W6VE.....270
CE3AG.....270
W9KOK.....268
W8DAW.....267
W2LPE.....266
W2JT.....264
W2WZ.....264
W6GPB.....263
W6YY.....263
W2HMJ.....261
W2TQC.....261
W3IYE.....261
HB9J.....261
SM5LL.....261
W6LDD.....260
W1ADM.....258
W8TMA.....256
W2KUW.....255
W4MR.....255
W4HA.....254
WØQVZ.....254
G3YF.....253
W6BZE.....252
W3DRD.....250
W4LZF.....250
K2GMO.....246
F8BS.....245
OK1FF.....245
W2CTO.....244
SM5ARP.....243
W8QJR.....241
4X4RE.....241
W4GXB.....240
W6KEV.....240
W6QNA.....240
W8PUD.....240
LA7Y.....240
K2HU.....238
W6YMD.....237
DL7BA.....237
W1ZW.....235
W2GUM.....235
W6LRU.....234
W8NGO.....234
G5VT.....234
W9WHM.....232
W5NW.....231
W6CHV.....231
GM3EST.....231
W2BBS.....230
W3PGB.....230
W5OGS.....230
G3AAE.....230
G3FNN.....230
PAØGN.....230
W2LAX.....229
W6YK.....229
W2HQL.....228
WØVBQ.....225
W2IWC.....224
W2YTH.....221
W6GMF.....221
W8VDJ.....221
OZ7BG.....221
W6CAE.....220
W8ACE.....220
HB9MQ.....220
W9VIN.....217
W1ZL.....214
G8KP.....214
OH3RA.....214
W6BUO.....213
W2REF.....212
K6UYC.....212
W7HKT.....212
HB9KB.....212
W6KEK.....211
W6ULS.....211
W7QGF.....211
W2SUZ.....210
W5TIZ.....210
W7MGT.....210
W9KXK.....210
W5LGS.....209
W1ZZK.....208
W4TFB.....207
W3HIX.....206
W2CWK.....205
W6ZVQ.....204
K9BVR.....204
W1LHZ.....203
W8IRN.....202
PY2OE.....202
W2LSX.....201
W5LGG.....201
W6LTX.....201
W9JIP.....201
W1OJR.....200
W1QNC.....200
W3AXT.....200
W3ZAO.....200
W4CGRP.....200
W5HJA.....200
WØBPA.....200
F3FA.....200
K4HVQ.....198
W8PWH.....196
PAØTAU.....195
W3FMC.....191
DL1GU.....191
TG9AD.....191
K2JYH.....190
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VE3JZ.....190
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W1RAN.....184
W9ROU.....184
CE3HL.....184
W9ERU.....183
K2PIC.....182
W2CKY.....181
K2UWR.....181
WØRBA.....181
G6RC.....181
W6UOV.....180
W2ESO.....180
W2OBX.....180
W3JNM.....180
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W3ZQ.....173
K5ADQ.....173
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W3RSR.....171
W8ONA.....171
W8WT.....171
WØGUV.....171
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W1QMM.....170
W2PZI.....170
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K6KJR.....170
W9QNO.....170
OH2TM.....170
F3AT.....169
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G3AJP.....168
W4EEO.....166
W6BSY.....166
DL3BZ.....166
W4AI8.....165
W9UC.....165
LA5B.....165
K9EAB.....164
SM6ID.....164
W3CPB.....162
W3WPG.....162
W8ILG.....162
YV5ABD.....162
W1EIO.....161
W9HKL.....161
K2VFR.....161
HB9NU.....161
W2GUR.....160
W3KVB.....160
W4TAJ.....160
W5JDA.....160
W5LV.....160
W2WTH.....160
W9PQA.....160
HB9NL.....160
SM5KV.....160
VE3IR.....160
K4HXF.....159
W6APH.....159
GM3EOJ.....158
W3AOH.....156
I1BLF.....155
HB9UL.....154
W3BYI.....153
W6KG.....153
G3HJJ.....152
W4IEH.....151
W9WJH.....151
CR7LU.....151
W1APU.....150
W2PDB.....150
W2RDD.....150
W7NRB.....150
FQ8AP.....150
PAØHJK.....150
K4HGR.....149
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K5ALA.....148
PAØHJK.....146
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K4DRO.....143
W5BQJ.....143
W5RX.....143
WØJSN.....143
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W2KXK.....142
W3BQA.....142
W4BWP.....142
DL7CX.....142
W4EFX.....141
W4IKM.....141
F8CB.....141
MP4BBE.....141
ST2AR.....141
VE3DKY.....141
K2DGT.....140
K2JGG.....140
W9OAN.....140
CN8DJ.....140
I1UB.....140
LA7XE.....138
HB9DB.....137
PAØOI.....135
KV4BK.....133
W9GFF.....132
W9OVF.....132
KØDQI.....132
G8TS.....132
ZE6JY.....132
W1HWH.....131
K6OWQ.....130
W8IQS.....130
W9CMQ.....130
W9MUJ.....130
DJ3JZ.....130
I1RMO.....130
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OE8KL.....127
W8ELL.....126
DL1ES.....126
DL8CM.....123
K6GJS.....122
W6HJ.....122
K6OXU.....122
W2PTD.....121
K4LTA.....121
W8UUS.....121
W8ZPX.....121
W1IUU.....120
W2QQ.....120
W4TR.....120
WØGBJ.....120
F3GL.....120
JA5AA.....120
W4GUV.....119
W8NZN.....113
W8IBX.....112
W3HQU.....111
W6PHN.....111
OZ4FF.....111
W8VVD.....110
SM5DDM.....110
VE7EH.....110

Radiotelephone

W6YY.....255
SM5ARP.....238
TI2RC.....234
W8DMD.....232
W9WHM.....232
Z86Q.....230
G5VT.....227
G3DO.....222
W3ECR.....221
W8VDJ.....221
SM5LL.....221
G3FNN.....220
PY4TK.....220
TI2HP.....220
HB9J.....211
W5ASG.....210
W1ADM.....209
W2JT.....206
W4DGR.....202
DL7BA.....201
W5TIZ.....197
ON4RC.....194
W7MGT.....191
VE3AIU.....191
W3HJA.....190
KL7AFR.....190
TG9AD.....190
LA7Y.....189
W8PWH.....186
TI2LA.....186
W4TFB.....183
W2ZX.....182
W3HIX.....182
CE3HL.....182
W5PQA.....181
K2CJN.....180
W8NGO.....180
OZ7FG.....180
W2CKY.....178
II6TE.....173
K4BVQ.....171
WØCPM.....171
W7EMP.....170
W8PUD.....167
W8WT.....165
W9JLH.....164
YV5ABD.....162
W8TMA.....161
W8MRC.....160
HB9NU.....160
II2CT.....160
WØZSZ.....154
W1FPH.....151
W4GRP.....151
4X4RE.....151
W3DRD.....147
W8EKW.....146
W4BWP.....142
W1LIB.....141
W4EFX.....140
W9PQA.....140
EA7EM.....140
W4EEO.....139
W1DCE.....135
W2IWC.....135
W6BCQ.....134
WØQVZ.....133
I1TBO.....132
PY4MZ.....132
W1KRS.....130
W3AOH.....130
W8MXS.....130
KØACC.....130
DL7CX.....129
K2JGG.....125
W6B8Y.....123
W6WTH.....122
W1LHZ.....121
W1BIH.....120
W9EU.....120
ZL2ANZ.....120
W5BQJ.....119
W9YRO.....114
WØMLY.....113
OD5AU.....111

W/VE/VO Call area and Continental Leaders

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W6TO.....273
W7GUV.....275
W9RBI.....277
W9YFV.....277
WØELA.....267
VE1EP.....210
VE2WW.....233
VE3QD.....210
VE4XO.....180
VE5RU.....163
VE6NX.....214
VE7ZM.....252
VE8AW.....195
VO1DX.....191
Z86BW.....274
4X4DK.....264

Radiotelephone

W2BXA.....232
W4HA.....232
W5BGP.....241
W7HEA.....211
W7HTB.....211
WØAIW.....233
VE1NH.....122
VE2WW.....163
VE3KF.....224
VE4RP.....102
VE5RU.....156
VE6NX.....115
VE7ZM.....217
G2PL.....254
4X4DK.....257

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W7PQJ	0.0	W0WKO	0.2
W8CUJ	0.0	W1PLJ	0.3
W8YCP	0.1	W5NKH	1.8
W4CVO	0.3	K6HI	2.2
W1MUN	0.5	W1NNX	4.9
W9VZF	0.5	W8YPT	5.2
W9TZN	0.7	Leroy Whittle	5.4
W8GBF	0.9	W4BJP	5.5
W2AIQ	1.3	K4MEZ	6.0
W1BKG	1.9	K6ZCR	6.0
W3LJV	3.2	K4UYY	6.1
W1QHS	4.4	K8CXI	6.9
W2QYT	5.9	W5JPM	7.1

A.R.R.L. ACTIVITIES CALENDAR

Jan. 8: CP Qualifying Run — W6OWP
Jan. 10–11: V.H.F. Sweepstakes
Jan. 17–18: CD Party (c.w.)
Jan. 21: CP Qualifying Run — W1AW
Jan. 24–25: CD Party (phone)
Jan. 31–Feb. 15: Novice Roundup
Feb. 4: CP Qualifying Run — W6OWP
Feb. 6–8: DX Competition (phone)
Feb. 13: Frequency Measuring Test
Feb. 19: CP Qualifying Run — W1AW
Feb. 20–22: DX Competition (c.w.)
Mar. 5: CP Qualifying Run — W6OWP
Mar. 6–8: DX Competition (phone)
Mar. 19: CP Qualifying Run — W1AW
Mar. 20–22: DX Competition (c.w.)
Apr. 1: CP Qualifying Run — W6OWP
Apr. 11–12: CD Party (c.w.)
June 27–28: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Jan. 9–11: WAE DX Contest (c.w.), DARC (p. 75, this issue).

Jan. 24–25: VE1 Contest, New Brunswick Amateur Radio Assn. (p. 152, this issue).

DXCC Notes

Announcement is hereby made of the addition to the ARRL Countries List of the Republic of Guinea. Formally counted as a part of French West Africa, this country will be considered as separate from French West Africa as of October 1, 1958. DXCC credit will be given starting March 1, 1959 for creditable confirmations dated on or after October 1, 1958 for this country.

Announcement also is made of the addition to the ARRL Countries List of Manihiki Islands. Sometimes called Northern Cook Islands, this group has formerly been considered as with the Cook Islands. The main islands in this group include Manihiki, Danger Island (Pukapuka), Tongareva and Rakahanga. DXCC credit for this country will be given starting March 1, 1959 for creditable confirmations dated on or after November 15, 1945.

With reference to the DXCC Note appearing in the July 1958 issue concerning ZL1ABZ confirmations, we are pleased to announce that *all* creditable confirmations for contacts made with ZL1ABZ dated on or after September 27, 1958 will be accepted for DXCC credit.

It is requested that none of the above confirmations be submitted for credit before March 1, 1959. This is to permit foreign amateurs to start receiving credits at the same time as those in the U. S. A. Confirmations received prior to March 1, 1959 will be returned without credit.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....289	W8JNN.....282	W3KT.....279
W6AM.....287	W8BRA.....281	W1ME.....279
ZL2GX.....287	W6SYG.....281	G2PL.....279
KV4AA.....285	W2BXA.....281	W8DMD.....279
PY2CK.....284	W5ASG.....281	W8NBK.....278
W3GHD.....283	G3AAM.....280	ZL1HY.....278
W8HGN.....282	W2AGW.....280	W6CUQ.....278
W8JIN.....282	W2HUQ.....279	W6DZZ.....278

Radiotelephone

PY2CK.....284	W3JNN.....271	CN8MM.....264
W8GZ.....276	W8BF.....268	CX2CO.....263
W1FH.....276	W8HGW.....267	W8KML.....263
VQ4ERR.....274	ZL1HY.....267	W6AM.....262
ZS6BW.....274	W9RBI.....264	ZL2GX.....259

From October 1, to November 1, 1958 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

G3FUR.....157	K6KII.....106	W1FQA.....102
G3DQC.....147	WØETV.....106	F9YZ.....102
W8SZS.....140	WØLPA.....106	ES5AB.....102
W1CBZ.....136	WØTGQ.....106	G3JZK.....102
W7HDL.....131	OZ3GW.....106	VE8OW.....102
W9LTR.....130	SM6BDS.....106	ZS1KO.....102
ZE1JV.....128	W2EHN.....105	K2IAD.....101
KP4ADS.....119	W4SHX.....105	DJ2CP.....101
PAØGER.....119	OE6FD.....105	W1BGH.....100
VQ3CF.....116	UO5AA.....105	W4YS8Y.....100
W6HAL.....113	YU3OV.....105	K6AUC.....100
K2UPD.....112	ZE6JL.....105	W7OEB.....100
ZP9AY.....111	W2QDY.....104	W7RYS.....100
ZS6IE.....110	W6JFV.....104	W7VOL.....100
W4PLL.....109	PY4ZI.....104	W9KXZ.....100
K6RTK.....108	VP6LT.....104	WØSLB.....100
W8WBU.....108	W2WMG.....103	DJ1WT.....100
W9MBF.....108	OE6BN.....103	OK2UD.....100
WØDVZ.....107	ZL4MK.....103	PY1BDU.....100

Radiotelephone

CE2CC.....212	G3JNX.....110	DJ2DW.....103
W2KUW.....152	G3AKX.....107	KR6RB.....102
PAØCT.....131	W5LTY.....106	G3DQC.....101
W3FWD.....130	W9MWO.....106	KP4GN.....101
W3ICQ.....124	W8SZS.....105	YU3JN.....101
ZL3PJ.....122	K5JEA.....104	W1QFQ.....100
W3HCO.....121	VK4EL.....104	W3ABW.....100
W8YBZ.....120	W2DEW.....103	W4Y8Y.....100
G8TS.....115	KØABH.....103	PY5QZ.....100
W6BAF.....112		ZS1KO.....100

ENDORSEMENTS

W2QHH.....271	W6QNA.....240	HB9KB.....212
W9LNM.....271	W8PUD.....240	W6KEK.....211
W7GBW.....271	LA7Y.....240	W6ULS.....211
W1GKK.....270	K2BU.....238	W7QGF.....211
W3GAU.....270	W6YMD.....237	W2SUC.....210
W6NNV.....270	DL7BA.....237	W5TIZ.....210
W6VE.....270	W1ZW.....235	W7MGT.....210
CE3AG.....270	W2GUM.....235	W9KXK.....210
W9KOK.....268	W6LRU.....234	W5LGS.....209
W8DAW.....267	W8NGO.....234	W1ZZK.....208
W2LPE.....266	G5VT.....234	W4TFB.....207
W2JT.....264	W9WHM.....232	W3HIX.....206
W2WZ.....264	W5NW.....231	W2CWK.....205
W6GPB.....263	W6CHV.....231	W6ZVQ.....204
W6YY.....263	GM3EST.....231	K9BWR.....204
W2HMJ.....261	W2BBS.....230	W1LHZ.....203
W2TQC.....261	W3PGB.....230	W8IRN.....202
W3IYE.....261	W5OGS.....230	PY2OE.....202
HB9J.....261	G3AAE.....230	W2LSX.....201
SM5LL.....261	G3FNN.....230	W5LGG.....201
W6LDD.....260	PAØGN.....230	W6LTX.....201
W1ADM.....258	W2LAX.....229	W9JIP.....201
W8TMA.....256	W6YK.....229	CR6AI.....201
W2KUW.....255	W2HQL.....228	HB9GJ.....201
W4MR.....255	WØVBQ.....225	W1QJR.....200
W4HA.....254	W2IWC.....224	W1QNS.....200
WØQVZ.....254	W2YTH.....221	W3AXT.....200
G3YF.....253	W6GMF.....221	W3ZAO.....200
W6BZE.....252	W8VDJ.....221	W4GRP.....200
W3DRD.....250	OZ7BG.....221	W5HJA.....200
W4LZF.....250	W6CAE.....220	WØBPA.....200
K2GMO.....246	W8ACE.....220	F3FA.....200
F8BS.....245	HB9MQ.....220	K4HVQ.....198
OK1FF.....245	W9VIN.....217	W8PWH.....196
W2CTO.....244	W1ZL.....214	PAØTAU.....195
SM5ARP.....243	G8KP.....214	W3FMC.....191
W8QJR.....241	OH3RA.....214	DL1GU.....191
4X4RE.....241	W6BUO.....213	TG9AJ.....191
W4GXB.....240	W2REF.....212	K2JYH.....190
W6KEV.....240	K6UYC.....212	PAØNU.....190
	W7HKT.....212	VE3JZ.....190

DJ2RW.....187	W1EIO.....161	ST2AR.....141
W1RAN.....184	W9HKI.....161	VE3DKY.....141
W9ROU.....184	K2VFR.....161	K2DGT.....140
CE3HL.....184	HB9NU.....161	K2JGG.....140
W9ERU.....183	W2GUR.....160	W9OAN.....140
K2PIC.....182	W3KVB.....160	CN8DJ.....140
W2CKY.....181	W4TAJ.....160	I1UB.....140
K2LWR.....181	W5DA.....160	LA7XE.....138
WØRBA.....181	W5LV.....160	HB9DB.....137
G6RC.....181	W2WTH.....160	PAØOI.....135
W6UOV.....180	W9PQA.....160	KV4BK.....133
W2ESO.....180	HB9NL.....160	W9GFF.....132
W2OBX.....180	SM5KV.....160	W9OVF.....132
W3JNM.....180	VE3IR.....160	KØDQL.....132
DL7CW.....180	K4HXF.....159	G8TS.....132
F9IL.....180	W6APH.....159	ZE6JY.....132
DL7EN.....178	GM3EOJ.....158	W1HWH.....131
W5QVZ.....176	W3AOH.....156	K6OWQ.....130
VP7NM.....174	I1BLF.....155	W8IQS.....130
W3ZQ.....173	HB9UL.....154	W9CMQ.....130
K5ADQ.....173	W3BYI.....153	W9MUJ.....130
W7ACD.....173	W6KG.....153	DJ3JZ.....130
W9WIO.....173	G3HJJ.....152	I1RMO.....130
VE3ES.....172	W4IEH.....151	W9YRO.....128
W3BSR.....171	W9WJH.....151	OE8KL.....127
W8ONA.....171	CR7LU.....151	W8ELL.....126
W8WT.....171	W1APU.....150	DL1ES.....126
WØGUV.....171	W2PDB.....150	DL8CM.....123
I1FO.....171	W2RDD.....150	K6GJS.....122
W1QMM.....170	W7NRB.....150	W6HJ.....122
W2PZI.....170	FQ8AP.....150	K6OXU.....122
W4UKA.....170	PAØHJK.....150	W2PTD.....121
K6KJR.....170	K4HGR.....149	K4LTA.....121
W9QNO.....170	DL1YQ.....149	W8UUS.....121
OH2TM.....170	K5ALA.....148	W8ZPX.....121
F3AT.....169	PAØHJK.....146	W1IUU.....120
JA8AA.....169	JA6FB.....144	W2QQ.....120
G3AJP.....168	K4DRO.....143	W4TK.....120
W4EEO.....166	W5BQJ.....143	WØGBJ.....120
W6BSY.....166	W5RX.....143	F3GL.....120
DL3BZ.....166	WØJSN.....143	JA5AA.....120
W4AIS.....165	VQ8AD.....143	W4GUV.....119
W9UX.....165	W2FKK.....142	W8ZNO.....113
LA5S.....165	W3BQA.....142	W8IBX.....112
K9EAB.....164	W4BWP.....142	W3HQU.....111
SM6ID.....164	DL7CX.....142	W6PHN.....111
W3CPB.....162	W4EFX.....141	OZ4FF.....111
W3WPG.....162	W4IKM.....141	W8VVD.....110
W8ILG.....162	F8GB.....141	SM5DX.....110
YV5ABD.....162	MP4BBE.....141	VE7EH.....110

Radiotelephone

W6YY.....255	TI2LA.....186	W8EKW.....146
SM5ARP.....238	W4TFB.....183	W4BWP.....142
TI2RC.....234	W2ZX.....182	W1LIB.....141
W8DMD.....232	W3HIX.....182	W4EFX.....140
W9WHM.....232	CE3HL.....182	W9PQA.....140
ZS6QA.....230	W5PGX.....181	EA7EM.....140
G5VT.....227	K2CJN.....180	W4EEO.....139
G3DO.....222	W8NGO.....180	W1DCE.....135
W3ECR.....221	OZ7FG.....180	W2IWC.....135
W8VDJ.....221	W2CKY.....178	W6BCQ.....134
SM5LL.....221	I1CTE.....173	WØQVZ.....133
G3FNN.....220	K4BVQ.....171	I1TBC.....132
PY4TK.....220	WØCPM.....171	PY6RZ.....132
TI2HP.....220	W7EMP.....170	W1KRS.....130
HB9J.....211	W8PUD.....167	W3AOH.....130
W5ASG.....210	W8WT.....165	W8MXS.....130
W1ADM.....209	W9JLH.....164	KØACC.....130
W2JT.....206	YV5ABD.....162	DL7CX.....129
W4DCR.....202	W8TMA.....161	K2JGG.....125
DL7BA.....201	W8MRC.....160	W6BSY.....123
W5TIZ.....197	HB9NU.....160	W6WTH.....122
ON4RC.....194	I1ZCT.....160	W1LHZ.....121
W7MGT.....191	WØZSZ.....154	W1BIH.....120
VE3AIU.....191	W1FPH.....151	W9EU.....120
W5HJA.....190	W4GRP.....151	ZL2ANZ.....120
KL7AFR.....190	4X4RE.....151	W5BQJ.....119
TG9AD.....190	W3DRD.....147	W9YRO.....114
LA7Y.....189		WØMLY.....113
W8PWH.....186		OD5AU.....111

W/VE/VO Call area and Continental Leaders

W4TM.....273	VE1EP.....210	VE6NX.....214
W4TO.....273	VE2WW.....233	VE7ZM.....252
W7GUV.....275	VE3QD.....210	VE8AW.....195
W9RBI.....277	VE4XO.....180	VO1DX.....191
W9YFV.....277	VE5RU.....163	Z86BW.....274
WØELA.....267		4X4DK.....264

Radiotelephone

W2BXA.....232	WØAIW.....233	VE5RU.....156
W4HA.....232	VE1NH.....122	VE6NX.....115
W5BGP.....241	VE2WW.....163	VE7ZM.....217
W7HIA.....211	VE3KF.....224	G2PL.....254
W7HTB.....211	VE4RP.....102	4X4DK.....257

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Richard B. Mesirov, W3JNQ—SEC: DVB. PAM: TEJ. RM: AXA. PFN meets Mon. through Fri. on 3850 kc. at 1800. The E. Pa. Net meets Mon. through Fri. on 3610 kc. at 1830. New appointees: IVS as OBS, K3BKI as York Co. EC, K3AKN as Juniata Co. EC. Former Juniata Co. EC K3AFP now resides permanently in Pensacola, Fla., and has resigned. UIU received the first Pennsylvania issue of the WWCNY award (Worked Westchester Co., N. Y.). The York ARC, EDU, purchased a new HT-32 for use at club headquarters at the York YMCA. FEY is now on 6 meters with 80 watts to an 829B and plans to be on 220 and 432 Mc. soon. CMN, QRT at his own location, helped DYT in the WWDX Test. VBI, past president of the Lancaster RTS, was killed in an airplane crash near Williamsport Oct. 17. EU expects to be a granpaw again in February and plans to go mobile in a rocking chair. K3ALD competed in the Oct. CD and VK/ZL Contests. Central High School (Phila.) RC now has the call K3GTZ. The Delaware-Lehigh ARC had a hidden transmitter hunt on Halloween, with the crew of EVY, FKE, SAP and K3CIS finding the rig hidden in the basement, thanks to a good loop and a flashlight. CUL has a new Triband beam working; hubby VR works 40-meter c.w. while Mae is on 80 meters. FCI and ZSX play varsity football on the Morrisville High team. BUR now has new beams on 2 and 6 meters. AXA finds life not so peaceful now that he is back as RM. ZRQ made WAS and WBE with a QSL from ZC4PA and is on 144.5 Mc., as is LDV. ZBD received a W-Conn award. The Bucks Co. ARC had a Christmas Party on its regular meeting night in December. The Philmont Mobile RC is now incorporated; its annual banquet will be held on January 17. The Frankford RC held its annual banquet/elections Dec. 7 .The Anthracite Wireless Assn. offered a fur-lined key handle to its highest scoring member in the SS (for winter use only). The Short Skip RC is designing a club QSL card. New officers of the Mike Farad RC are LJA, pres.; 4DAB/3, vice-pres.; AHZ, secy.; YFF, treas. New headquarters of the Lancaster RTS is the Red Cross Chapter House in Lancaster. DJW soon will have a new Seneca transmitter on 6 and 2 meters with 140 watts. Traffic: W3CUL 3192, MJM 162, AXA 134, BNR 134, VR 79, ZRQ 79, FKE 61, K3ALD 58, W3BFF 55, UIU 21, AMC 19, HNK 19, K3AAM 15, W3BUR 15, NQB 10, FCI 5, PDJ 3.

MARYLAND—DELAWARE—DISTRICT OF COLUMBIA—SCM, Louis T. Croneberger, W3UCR—Asst. SCM for Delaware: Ray deCourcelle, 3DQZ. SEC: YYB. New appointments: CQX as ORS, NNX as OPS and K3BBV as OO. Section nets: MDD, 3650 kc. M-S 1915, MEPN, 3820 kc. MWF 1800 SS 1300. Del. EN 3905 kc. Sat. 1830. The RCARA had K3FUQ, of the National Institute of Health, at the Oct. 10 meeting and he spoke on "Electronic Problems In Recording Inside Single Nerve Cells." Mr. Dave Sample, Chief of Communications and Warning Service for Baltimore Civil Defense, spoke at the Oct. 20 meeting of the BARC on "The New Mobile District Control Centers" that Baltimore City has on order. *The Modulator*, bulletin of the BARC, has finally revealed that its editor is MAZ. The NCVHF Society meeting of Oct. 30 had 4UCH, who spoke on "Linear Amplifiers For Six Meters." The WRC had a movie on "The Venezuelan Oil Fields" and a surprise visit from the SCM at its Oct. 3 meeting. YAG spoke on "This Crusty Old Earth's Crust" at the Oct. 24 meeting of the RCARA. GVN and K3BCA are directing the code classes for 19 prospective hams for the ARA. HCARA's theory classes are being conducted by PRC and 4TLB. GTZ has been elected NCM for the Del. EN. PZA. (WRC club station) participated in both days of the October S.E.T., with BKE, CN, K3AKB and K4LMB holding down the watches. The Maryland V.H.F. Society has formed the Md. Six-Meter Emergency Net and is in operation in Baltimore and vicinity on 50.250 Mc. each Wed. at 2100. K3CYE is NCM. K3EHS is now Tech. Class. New Novices are KN3s GMC, GJC, GVD (using a Globe Scout and a BC-348) as well as GUB (the YL) and GTJ (the XYL), both from Salt Lake City, Utah. 8MYC and 8THF are awaiting their "3" calls in the Washington Area. NUP is moving to Atlantic City, N. J. CHG has moved back to MDD to a new QTH near Ft. Meade. TOR, ONP and K3DOQ are now on s.s.b. WV is sporting a new Tribander. BAG, WOD, YGN and KN3ELB are all active on 2 meters in the Catonsville Area. KN/3CXC reports working some FB DX with a DX-40 and an SX-99. NJT reports that IXX has just returned from Mexico City and a visit to XE1IQ. FBR has gone to Ethiopia with his family and soon will be heard from ET2US. Word is that GVN is moving near Smithsburg to give LII and JZY some competition in antennas and DX. GBU and DMW (the twins) are on s.s.b. with a Valiant and an exciter. CGT is on d.s.b. on 40 and c.w. on 20 meters with a new homebrew rig. ZAR, now DL4ACN, is heard almost every week end on 29.5 Mc. ZCK did a very fine job in handling messages from the "Little World's Fair" at Edmondson Village. The display and station (FT) was manned by the BARC. UE, BUD, CVE, TN and K3WBJ earned BPL for October traffic. UE reports a need for Baltimore stations on the MDD. ZGN reports EAX is back on the nets for the school year at College Park. KA is back from KS4 and Ralph reports 1844 QSOs, WAC both on c.w. and phone and 54 countries worked. ER was the cover story of *Auto Call* for November. W6OKI/KL7, formerly at Aberdeen, has been working into the MDD on the high end of 10 meters. IXA is now on 2 meters with a Communicator and a beam. Reports of station and club activities should be mailed to reach the SCM by the 5th of each month for the preceding month for inclusion in the MDD column. Happy New Year and all the best for the coming year. Traffic: (Oct.) W3UE 506, BUD 271, QCW 201, K3WBJ 176, W3CVE 162, TN 147, PQ 109, MCG 86, BKE 58, CN 56, COK 52, EAX 36, K3EFF 6, W3ECP 5, KA 5, CDQ 2. (Sept.) W3WSE 9.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW, W2YRW and W2ZI. Again K2OOK is top traffic-handler. K2ARY, Salem Co. EC, reports activity in the S.E.T. W2ZI has moved to a new QTH. K2SOL is acting manager of the Jersey Phone and Traffic Net during Ed's QRT. K2CPR's DX total this month is 239/228. Net certificates have been issued to K2OOK and W2ZRO. NJN attendance was 525 and traffic 402. Mercer County took an active part in the October RACES drill. W2SVV has resigned as Mercer Co. EC. K2RYH succeeds W2ZVW as 2RN Manager. W2ZVW has been elected SCM of Northern New Jersey. W2RXL will succeed W2HDW as NJN mgr. as of January 1959. K2ITP made 400 contacts in the recent V.H.F. QSO Party. K2SXN and K2BPX are heard regularly on 6 meters. W2LBX, K2MIO and W2YRW are directing the activities at the Delaware Twp. C.D. Headquarters. K2SOW and K2DSL are QRT because of school. W2RG, K2MBD, W2HDW, K2OOK and K2BG attended the NJN November meeting at New Brunswick. W2EWN is SJRA's "Amateur of the Year" award chairman. K2KTS continues his fine work conducting SJRA's training classes. W2WKI and W2DBP have been training prospective RACES operators in Burlington County. Club secretaries are requested to advise me of the change of club officers. Traffic: K2OOK 657, W2HDW 130, K2JGU 93, W2BZJ 57, W2ZI 23, K2CPR 10, K2SOL 8.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2PPY. RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (V.H.F.). NYS C.W. meets on 3615 kc. at 1800, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, LSN on 3970 kc. at 1900. Happy New Year! The Syracuse V.H.F. club held its annual "Roundup" at Three Rivers Inn. All of the top v.h.f. men were there (over 300) and W3YA and your SCM are recommending to ARRL that possibly in the future the affair would be recognized as a "National V.H.F. Convention." The following hams participated in "Operation Collect" for the Community

(*Continued on page 110*)

THE INTERSTATE SINGLE SIDEBAND NET

ONE of the reasons that we as amateurs are allowed to enjoy our hobby is the fact that amateur radio supplies an invaluable group of skilled communicators, capable of providing communications in times of disaster or emergency. Many amateurs feel strongly that they are morally obligated to be well trained in the efficient handling of traffic in order to be sure that, when an emergency does arise, they are well qualified to assume this responsibility. To provide this training, groups of amateurs have banded together and formed nets. This is the story of one such net.

IN THE early summer of 1952, W9KOY, W8BN, W8ALP and other public spirited single sidebanders started the Interstate Single Sideband Net. It was felt that the regular handling of routine traffic would be the best way to obtain the smooth operating procedure necessary for efficient emergency operation. W9KOY was elected Net Manager, a post which he held until October 1, 1957. Such was the modest beginning of a net, which today is recognized by many as one of the outstanding traffic handling organizations in amateur radio.

TODAY, over six years later, it might be well to look back at some of the accomplishments of the Interstate Single Sideband Net.

—— The largest attendance came on December 27, 1956, when 141 stations, representing 37 states, checked in.

—— The largest single night's traffic total was 104 pieces of traffic, handled in two hours and ten minutes on October 12, 1958.

—— The net maintains an extensive liaison system with most nets in the United States and can put traffic anywhere in the world where third party traffic is legal.

—— They have participated in many emergencies, including the Lake Charles hurricane, and recent tornadoes in the midwest.

—— While overall figures are not available, an idea of the overall operation can be realized from the record kept by W8NWU, who has been Tuesday night NCS for about 18 months. During this period (74 sessions), 4118 stations checked in and 1575 messages were handled.

K8AEC, Net Manager since October 1, 1957, furnished the following reasons for the success of the net:

1. The objective of the group is service — not individual high scores in traffic handling.
2. The flexibility achieved through voice controlled operation, and the additional talk power of SSB contributed to the efficiency and reliability of communications.

IT WAS pointed out that all types of stations — AM, CW, or SSB — are welcome to call into the net with or without traffic. The net meets on 3985 kc daily at 2000 EST. Net control stations are W9KOY — Sunday, K8AEC and W8BZB — Monday, W8NWU — Tuesday, W9NWK — Wednesday, K8GQW — Thursday, K8HHB — Friday, and W9IDA — Saturday.

AS PIONEERS in the development of single sideband for amateurs, we salute the accomplishments of the Interstate Single Sideband Net, with complete confidence in its continued growth and success. TOM STUART, WØREP

Bill Halligan Jr. W. J. Halligan W9AC for hallicrafters

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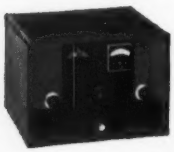


"CHALLENGER" TRANSMITTER

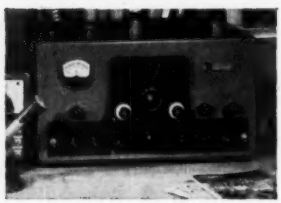
Ideal for fixed station, portable or field day use, the "Challenger" is designed for fast, easy tuning, excellent stability and plenty of reserve drive. 70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW input on 6 meters. Wide-range pi-network output—effectively TVI suppressed—excellent keying system. For crystal or external VFO control. With tubes.

Cat. No.	Amateur Net
240-182-1..Kit	$114.75
240-182-2..Wired	$154.75

"RANGER" TRANSMITTER/EXCITER

This popular, superbly engineered transmitter also serves as an RF/audio exciter for high power equipment. 75 watts CW or 65 watts phone input. Built-in VFO or crystal control—instant bandswitching 160 through 10. 6146 final amplifier—wide range pi-network output. Timed sequence keying. TVI suppressed. With tubes, less crystals.

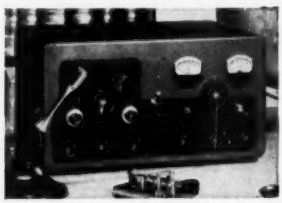
Cat. No.	Amateur Net
240-161-1..Kit	$229.50
240-161-2..Wired and tested..	$329.50



"VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 through 10. Built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. With tubes, less crystals.

Cat. No.	Amateur Net
240-104-1..Kit	$349.50
240-104-2..Wired and tested..	$439.50

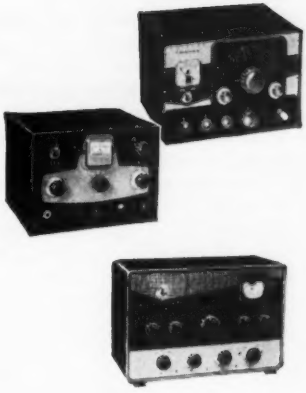


"FIVE HUNDRED" TRANSMITTER

More than one-half kilowatt of power and operating convenience! 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 tl.rough 10 meters! All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Highly stable, built-in VFO or crystal control. Wide range pi-network output. Low level audio clipping—effectively TVI suppressed. With tubes, less crystals.

Cat. No.	Amateur Net
240-500-1..Kit	$749.50
240-500-2..Wired	$949.50

E. F. JOHNSON COMPANY
2901 SECOND AVENUE S.W.



"NAVIGATOR" TRANSMITTER/EXCITER

More than a novice transmitter—serves as a flexible VFO-Exciter with enough RF power to excite most high powered amplifiers on CW and AM! 40 watts CW input—6146 final amplifier tube—wide range pi-network output. Built-in VFO or crystal control—bandswitching 160 through 10. Timed sequence keying. TVI suppressed. With tubes, less crystals.

Cat. No.	Amateur Net
240-126-1..Kit	$149.50
240-126-2..Wired and tested	$199.50

"ADVENTURER" TRANSMITTER

Perfect for novice or experienced amateur! 50 watts CW input—instant bandswitching 80 through 10 meters. Crystal or external VFO control. With tubes, less crystals.

Cat. No.	Amateur Net
240-181-1..Kit	$54.95

"6N2" TRANSMITTER

Punches your signal out with 150 watts CW and 100 watts phone input. Bandswitching 6 and 2 meters. TVI suppressed. May be used with Viking "Ranger" or similar power supply/modulator combination. Crystal control or external VFO with 8-9 output. With tubes.

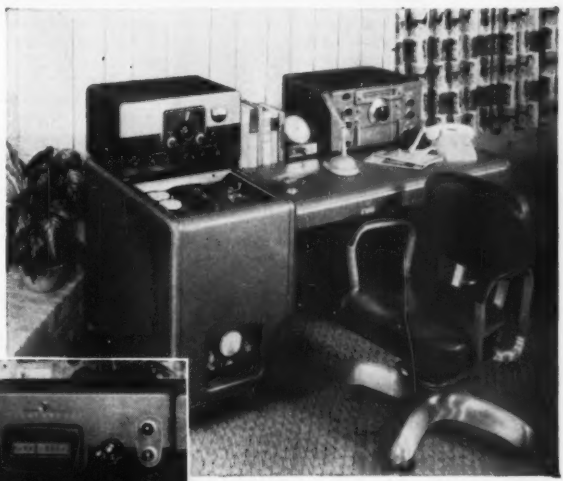
Cat. No.	Amateur Net
240-201-1..Kit	$129.50
240-201-2..Wired	$169.50

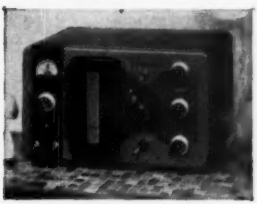
"KILOWATT" AMPLIFIER

Here's the most exciting unit you've ever seen . . . the unit that puts the whole world at your fingertips! Brilliantly designed and engineered, the Viking "Kilowatt" is the only power amplifier available which will deliver full 2000 watts SSB* input and 1000 watts CW and AM! Continuous coverage 3.5 to 30 mc. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No.	Amateur Net
240-1000..Wired and tested	$1595.00
251-101-1..Matching desk top, back and 3 drawer pedestal..FOB Corry, Pa.	$132.00

**The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.*





"COURIER" AMPLIFIER

This power-packed Class B linear amplifier is rated 500 watts P.E.P. input with aux. SSB exciter—500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: 5 to 35 watts. Employs two 811A triodes in parallel—wide range pi-network. TVI suppressed. With tubes.

Cat. No.	Amateur Net
240-352-1..Kit	$244.50
240-352-2..Wired	$289.50

"THUNDERBOLT" AMPLIFIER

Here's real power and peak performance in a compact desk-top amplifier. Rated 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs.—instant bandswitching. May be driven by the "Ranger", "Pacemaker" or other unit of comparable output. Two 4-400A tetrodes in parallel, bridge neutralized. Wide range pi-network output. With tubes.

Cat. No.	Amateur Net
240-353-1..Kit	$524.50
240-353-2..Wired	$589.50

"PACEMAKER" TRANSMITTER/EXCITER

An outstanding power bargain when used as a transmitter or exciter! 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Highly stable built-in VFO. Instant bandswitching 80, 40, 20, 15 and 10 meters. VOX and anti-trip circuits. Wide range pi-network output. Effectively TVI suppressed. With tubes and crystals.

Cat. No.	Amateur Net
240-301-2..Wired	$495.00

Viking

FIRST CHOICE AMONG THE NATION'S AMATEURS

WASECA, MINNESOTA

'All of these licensed radio amateurs make important contributions to the Heath line of fine ham kits. In a sense, they are your personal representatives within the company, because their design ideas and performance preferences reflect not only their own "on-the-air" experiences, but those of the amateur fraternity with which they are in constant contact. With this kind of representation in Benton Harbor, you can continue to rely on high-performance Heathkit amateur radio equipment designed by hams, for hams!

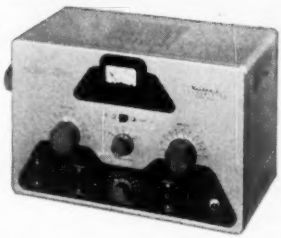
HEATH *hams work to bring you*

ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20

$35.95



If high efficiency at low cost in a CW transmitter interests you, you should be using a DX-20! It employs a single 6DQ6A tube in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Single-knob band-switching is featured to cover 80, 40, 20, 15, 11 and 10 meters, and a pi network output circuit matches antenna impedances between 50 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced class CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and pictorial diagrams. All the parts are top-quality and well rated for their application. "Potted" transformers, copper-plated chassis, and ceramic switch insulation are typical. Mechanical and electrical construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter for you! Shpg. Wt. 19 lbs.

HEATHKIT "APACHE" HAM TRANSMITTER KIT

- **Newly Designed VFO—Provision For S.S.B. Adapter**
- **Modern Styling—Rotating Slide Rule Dial**

MODEL TX-1 **$229.50** Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

Fresh out of the Heath Company laboratories, the brand-new "Apache" model TX-1 Ham Transmitter features modern styling and is designed as a handsome companion to the also-new Heathkit "Mohawk" receiver. The "Apache" is a high quality transmitter operating with 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, the "Apache" features built-in switch selected circuitry providing for single-sideband transmission through the use of a plug-in external single-sideband adapter. These Heathkit adapters will be available in the near future. A compact, stable and completely redesigned VFO provides low drift frequency control necessary for single-sideband transmission. An easy-to-read slide rule type illuminated rotating VFO dial with vernier tuning provides ample bandspread and precise frequency setting. Simple band-switching control allows flip-of-the-wrist selection of the amateur bands on 80, 40, 20, 15 and 10 meters (11 M with crystal control). The "Apache" features adjustable low level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL-34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely enclosed in a perforated aluminum shielding for greater TVI protection and transmitter stability. Cabinet comes completely preassembled with top hatch for convenient access without taking chassis out of cabinet. Die-cast aluminum knobs and front panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. Incorporates all the refinements necessary with many "plus" features for effective and dependable communications. Shpg. Wt. 115 lbs.

...top quality at lowest prices!

HEATHKIT "MOHAWK" HAM RECEIVER KIT

- **All Critical Circuits Prewired and Aligned**
- **Crystal Controlled Oscillators for Drift-Free Reception**

MODEL RX-1 **$274.95** Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

Outstanding results can be expected with the new "Mohawk" receiver which is designed to combine all the necessary functions required in a high quality communications receiver. A perfect companion for the Heathkit "Apache" transmitter, the "Mohawk" features the same wide-band slide rule type vernier tuning and covers all of the amateur bands from 160 through 10 meters on seven bands with an extra band calibrated to cover 6 and 2 meters using a converter. External receiver powered, accommodations are available for these converters which will be available in Heathkits soon. The "Mohawk" is specially designed for single-sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled, wired and aligned front end assures ease of assembly. All critical wiring is done for you insuring top performance. This 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc. Five selectivity positions from 5 kc to 500 CPS. A bridged T-notch filter is employed for maximum heterodyne rejection. Complete accuracy is obtained with the use of a built-in 100 kc crystal calibrator and the set features 10 db signal-to-noise ratio at less than 1 microvolt input. S-meter and many other fine features built-in for top-notch signal reception. Shpg. Wt. 90 lbs.

HEATH COMPANY A Subsidiary of Daystrom, Inc. **BENTON HARBOR 9, MICH.**

HEATHKIT PHONE & CW TRANSMITTER KIT

MODEL DX-40 **$64.95**

The DX-40 incorporates the same high quality and stability as the DX-100, but is a lower powered rig for crystal operation, or for use with an external VFO. Plate power input is 75 watts on CW, permitting the novice to utilize maximum power. An efficient, control-carrier modulator for phone operation peaks up to 60-watts, so that the rig has tremendous appeal to the general class operator also. Single-knob switching covers 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling makes for easy antenna loading, and pi network interstage coupling between the buffer and final amplifier improves stability and attenuates harmonics. A line filter is incorporated for power line isolation. The efficient oscillator and buffer circuits provide adequate drive to the 6146 final amplifier from 80 to 10 meters, even with an 80-meter crystal. A drive control adjustment is provided, and the function switch incorporates an extra "tune" position so that the buffer stage can be pretuned before the final is switched on. A switch selects any of three crystals, or a jack for external VFO. High quality D'Arsonval meter for tuning. Shpg. Wt. 26 lbs.

HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL DX-100 **$189.50** Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built-in VFO, built-in modulator, TVI suppression, pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, pi network interstage coupling, and high quality materials throughout. Copper plated 16-gauge steel chassis, ceramic switch contacts, etc., are typical of the kind of parts you get, in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11 and 10 meters with a single bandswitch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final amplifier, modulated by a pair of 1625 tubes in parallel. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and case styling is completely functional, for operating convenience. Designed exclusively for easy step-by-step assembly. No other transmitter in this power class combines high quality and real economy so effectively. Here is a transmitter that you will be proud to own. Time payments are available! Shpg. Wt. 107 lbs.

more fine ham gear from the pioneer

HEATHKIT GRID DIP METER KIT

A Grid Dip Meter is basically an RF Oscillator used to determine the frequency of other Oscillators, or tuned circuits. Numerous other applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, designing new coils, etc. Features continuous frequency coverage from 2 MC to 250 MC, with a complete set of prewound coils, and a 500 ua panel meter. Has sensitivity control and a phone jack for listening to the "Zero-Beat". It will also double as an absorption-type wave meter. Shpg. Wt. 4 lbs.

MODEL GD-1B **$21.95**

Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC.
Shpg. Wt. 1 lb. No. 341-A **$3.00**

HEATH COMPANY A Subsidiary of Daystrom, Inc. BENTON HARBOR 9, MICHIGAN

HEATHKIT ALL-BAND COMMUNICATIONS-TYPE RECEIVER KIT

Ideal for the short wave listener or beginning amateur, this Receiver covers 550 KC through 30 MC in four bands. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer type—power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—internal 5¼" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.
Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. **$4.95**

MODEL AR-3 **$29.95**

HEATHKIT ELECTRONIC VOICE CONTROL KIT

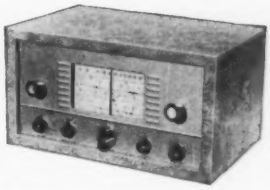
Here is a new and exciting kit that will add greatly to your enjoyment in the ham shack. Allows you to switch from Receiver to Transmitter merely by talking into your microphone. Lets you operate "break-in" with an ordinary AM transmitter. A terminal strip is provided for Receiver and speaker connections and also for a 117 volt antenna relay. Unit is adjustable to all conditions by sensitivity and gain controls provided. Easy to build with complete instructions provided. Requires no transmitter or Receiver alterations to operate. Shpg. Wt. 5 lbs.

MODEL VX-1 **$23.95**

HEATHKIT "Q" MULTIPLIER KIT

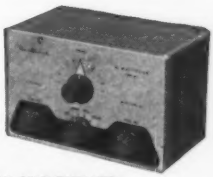
This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a hetrodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC at 300 ma (or 12.6 VAC at 150 ma), and 150 to 250 VDC at 2 ma. Simple to connect with cable and plugs supplied. Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.

MODEL QF-1 **$9.95**



ALL-BAND RECEIVER

ELECTRONIC VOICE CONTROL



"Q" MULTIPLIER

NOTE: $10.65 WHEN ORDERED WITH AR-3 BECAUSE OF EXCISE TAX.

...in do-it-yourself electronics!

HEATHKIT "AUTOMATIC" CONELRAD ALARM KIT

Designed to give instant warning whenever a monitored station goes off the air, the CA-1 automatically cuts the AC power to your transmitter, and lights a red indicator. Works with any radio receiver; AC-DC—transformer operated—battery powered, so long as the receiver has AVC. A manual "reset" button is provided to reactivate the transmitter. Incorporates a heavy-duty 6-ampere relay, a thyratron tube, and its own built-in power supply. A neon lamp shows that the alarm is working. Simple to install and connect with complete instructions provided for assembly and operation. Shpg. Wt. 4 lbs.

MODEL CA-1 **$13.95**

"AUTOMATIC" CONELRAD ALARM

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

Enjoy the convenience and flexibility of VFO operation by obtaining this fine variable frequency oscillator. It covers 160-80-40-20-15-11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a, available on most transmitters. It features voltage regulation for frequency stability, and has illuminated frequency dial. VFO operation allows you to move out from under interference and select the portion of the band you want to use without having to be tied down to only 2 or 3 frequencies through the use of crystals. "Zero in" on the other fellows signal and return his CQ on his own frequency! Shpg. Wt. 7 lbs.

MODEL VF-1

$19.50

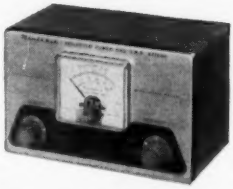
VARIABLE FREQUENCY OSCILLATOR

HEATHKIT REFLECTED POWER METER KIT

A necessity in every well equipped ham shack, the model AM-2 lets you check the match of the antenna transmission system, by measuring the forward and reflected power or standing wave ratio. Handles up to one kilowatt of energy on all bands from 160 to 2 meters, and may be left in the antenna system feed line at all times. Input and output impedances for 50 or 75 ohm lines. No external power required for operation. Meter indicates percentage forward and reflected power, and standing wave ratio from 1:1 to 6:1. Shpg. Wt. 3 lbs.

MODEL AM-2

$15.95



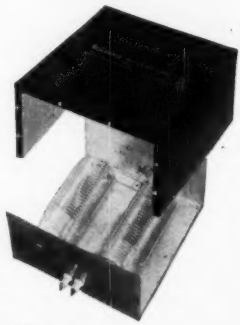
REFLECTED POWER METER

HEATHKIT BALUN COIL KIT

This convenient transmitter accessory has the capability of matching unbalanced coax lines, used on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance. Design of the bifilar wound Balun Coils will enable transmitters with unbalanced output to operate into balanced transmission line, such as used with dipoles, folded dipoles or any balanced antenna system. Can be used with transmitters and Receivers without adjustment over the frequency range of 80 through 10 meters. Will handle power inputs up to 200 watts. Shpg. Wt. 4 lbs.

MODEL B-1

$8.95



BALUN COIL

save ½ or more . . . with HEATHKITS

FREE 1958 Catalog

Send for this Free informative catalog listing our entire line of kits, with complete schematics and specifications.

☐ **Rush Free 1958 catalog.**

HEATH COMPANY

BENTON HARBOR 9, MICH. a subsidiary of Daystrom, Inc.

name _____

address _____

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QUAN.	ITEM	MODEL NO.	PRICE

$_____enclosed. Parcel post, include postage—express orders are sent shipping charges collect. All prices quoted are Net F.O.B. Benton Harbor, Mich. and apply to Continental U.S. and Possessions only. All prices and specifications subject to change without notice.

Fixing It–Or Making It?
Do It With MALLORY...
Switches, Plugs and Jacks

If you're a "roll-your-own" fan getting ready to build a new rig or accessory gear—or if you're repairing your own—you'll like the top quality you get with Mallory switches, plugs and jacks. There's a wide choice of standard designs, only a few of which are shown here.

These Mallory components embody many years of pioneering experience in designing for the electronics industry. They're precision-made by Mallory's manufacturing techniques to assure superior performance in your equipment. When you build or repair with Mallory switches, plugs or jacks, you build in the added economies of long life and dependability.

For complete information on these and all Mallory components, see your nearby distributor . . . or write the Mallory Hamshack, P. R. Mallory & Co. Inc., P.O. Box 1558, Indianapolis 6, Ind.

P. R. MALLORY & CO. INC.
INDIANAPOLIS 6, INDIANA

P. R. MALLORY & CO. Inc.
MALLORY

Big signal—
HT-33A
Linear Amplifier
SX-101 Mark IIIA Receiver
Heavyweight champion in stability, performance!
SX-101 MARK IIIA is setting new standards for dependability and ruggedness throughout the amateur world. It's all amateur; provides complete coverage, and every technical feature desired for years to come.
FREQUENCY COVERAGE: Band 1—30.5-34.5 Mc. Band 2—3.48-4.02 Mc. Band 3—6.99-7.31 Mc. Band 4—13.98-14.415 Mc. Band 5—20.99-21.52 Mc. Band 6—26.9-29.8 Mc. Band 7—10 Mc. WWV.
FEATURES: Complete coverage of five ham bands plus a 2 and 6 meter conv. band—80, 40, 20, 15, 10 meters. Large slide rule dial. Band-in-use scales individually illuminated. Illuminated S-
Available with convenient terms from your Radio Parts Distributor
HT-32A
Transmitter

The *new* ideas in amateur radio are born at . .

Export Sales: International Division Raytheon Manufacturing Co., Waltham, Mass.

effortless performance!

Beautifully engineered with extra-heavy-duty components, the HT-33A is *conservatively rated* at the maximum legal limit. You are guaranteed one of the big signals on the band, plus the effortless performance that means so much to efficiency and long life. (Conforms to F.C.D.A. specifications.)

FREQUENCY COVERAGE: Complete coverage of amateur bands; 80, 40, 20, 15, 10 meters.

FEATURES: Rated *conservatively* at the maximum legal input. Third and fifth order distortion products down in excess of 30 db. Built-in r.f. output meter greatly simplifies tune-up. All important circuits metered. Maximum harmonic suppression obtained through pi-network. Variable output loading. Protection of power supply assured by circuit breaker. HT-33A is a perfect match to Hallicrafters' famous HT-32 in size, appearance and drive requirements.

CIRCUIT DETAILS: This power amplifier utilizes a PL-172 high efficiency pentode operating in class AB1 or AB2. The tube is grid-driven across a non-inductive resistor, thus assuring the maximum stability under all possible conditions. Band switching is accomplished by one knob which selects the proper inductance value for each band. The output circuit is a pi-network with an adjustable output capacitor, so loads from 40 to 80 ohms may be accommodated. A d.c. milliameter may be switched to various circuits to measure the following: Cathode current, grid current, screen current, plate voltage, and r.f. voltage across the output line for tune-up.

TUBES: (1) PL-172 high power pentode; (2) 3B28 rectifiers; (4) OA2 screen regulators.

FRONT PANEL CONTROLS: Meter selector; Filament switch; High Voltage switch; Bias adjustment; Band switch; Plate tuning; Plate loading.

PHYSICAL DATA: Gray and black steel cabinet (matches HT-32) with brushed chrome knob trim. Size: 8¾" x 19" (relay rack panel). Shipping wt. approx. 130 lbs.

REAR CHASSIS: Co-ax input; co-ax output; filament and bias fuse; cutoff bias relay terminals; screen fuse; ground terminal.

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meter. Dual scale S-meter. S-meter zero point independent of sensitivity control. S-meter functions with AVC off. Special 10 Mc. position for WWV. Dual conversion. Exclusive Hallicrafters' upper-lower sideband selection. Second conversion oscillators quartz crystal controlled. Tee-notch filter. Full gear drive from tuning knob to gang condensers – absolute reliability. 40:1 tuning knob ratio. Built-in precision 100 kc. evacuated marker crystal. Vernier pointer adjustment. Five steps of selectivity from 500 cycles to 5000 cycles. Precision temperature compensation plus Hallicrafters' exclusive production heat cycling for lowest drift. Direct coupled series noise limiter for improved noise reduction. Sensitivity – one microvolt or less on all amateur bands. 52 ohm antenna input. Antenna trimmer. Relay rack panel. Heaviest chassis in the industry–.089 cold rolled steel. Double spaced gang condenser. 13 tubes plus voltage regulator and rectifier. Powerline fuse.

FRONT PANEL CONTROLS: Main tuning knob with 0-100 logging dial. Pointer reset, antenna trimmer, tee-notch frequency, tee-notch depth, sensitivity, band selector, volume, selectivity, pitch (BFO), response–(upper-lower-sideband). AVC on/off, BFO on/off, ANL on/off, Cal. on/off, Rec./standby.

TUBES AND FUNCTIONS: 6CB6, R.F. amplifier–6BY6, 1st converter–12 BY7A, high frequency oscillator–6BA6, 1650 kc. i.f. amplifier–12AT7, dual crystal controlled 2nd conversion oscillator–6BA6, 2nd converter–6C4, 1st 51 kc. i.f. amplifier–6BA6, 2nd 51 kc. i.f. amplifier–6BJ7, detector, A.N.L., A.V.C.–6SC7, 1st audio amplifier & B.F.O.–6K6, audio power output – 6BA6, S-meter amplifier – 6AU6, 100 kc. crystal oscillator–OA2, voltage regulator–5Y3, rectifier.

PHYSICAL DATA: 20" wide, 10½" high and 16" deep–Panel size 8¾" x 19"–weight approximately 74 lbs. (Conforms to F.C.D.A. specifications.)

Acclaimed by the most critical!

Now proven superior – vastly superior – is Hallicrafters' exclusive 5.0 mc. quartz crystal filter system. First practical *high frequency* filter, provides unprecedented rejection of unwanted sideband–50 db. or more–and *world's cleanest signal.*

Another major advance: Bridged-Tee Modulator, temperature stabilized and compensated.

FEATURES: 5.0 mc. quartz crystal filter–rejection 50 db. or more. Bridged-tee modulator. C.T.O. direct reading in kilocycles to less than 300 cycles from reference point. 144 watts plate input (P.E.P. two-tone). Five band output (80, 40, 20, 15, 10 meters). All modes of transmission – CW, AM, S.S.B. Unwanted sideband down 50 db. or more. Distortion products down 30 db. or more. Carrier suppression down 50 db. or more. Both sidebands transmitted on A.M. Precision gear driven C.T.O. Exclusive Hallicrafters patented sideband selection. Logarithmic meter for accurately tuning and carrier level adjustment. Ideal CW keying and break-in operation, Push To Talk and full voice control system built in. Phone patch input provided. Keying circuit brought out for teletype keyer.

FRONT PANEL CONTROLS, FUNCTIONS AND CONNECTIONS: Operation–power off, standby, Mox., Cal., Vox.–P.T.T. Audio level 0-10 R.F. level 0-10. Final tuning 80, 40, 20, 15, 10 meters. Function–Upper sideband, lower sideband, DSB, CW. Meter compression. Calibration level 0-10. Driver tuning 0-5. Band selector–80, 40, 20, 15, 10 meters. High stability, gear driven V.F.O. with dial drag. Microphone con. Key jack. Headphone monitor jack.

TUBES AND FUNCTIONS: 2-6146 Power output amplifier. 6CB6 Variable frequency oscillator. 12BY7 R. F. driver. 6AH6 2nd Mixer. 6AH6 3rd Mixer. 6AB4 Crystal oscillator. 12AX7 Voice control. 12AT7 Voice control. 6AL5 Voice control. 12AX7 Audio Amp. 12AU7 Audio amp. and carrier Oscillator. 12AU7 Diode Modulator. 12AT7 Sideband selecting oscillator. 6AH6 1st Mixer. 6AH6 4.95 Mc. Amp. 6AU6 9.00 Mc. Amp. 5R4GY HV Rectifier. 5V4G LV Rectifier. OA2 Voltage Regulator.

REAR CHASSIS: Co-ax antenna connector. FSK jack A.C. accessory outlet. Line fuse. Control connector. AC power line cord. Cabinet 20" wide, 10½" high, and 17" deep. Approximate shipping weight 86 lbs. (Conforms to F.C.D.A. specifications.)

The **hallicrafters** Company

Chicago 24, Ill.

GOTHAM ON ANTENNAS • • • • • • • SOME QUESTIONS AND ANSWERS

As one of the oldest antenna manufacturers consistently advertising in *QST*, we think it is a good idea to sum up our activities, comment on the antenna industry, and answer questions that arise year after year.

We have seen scores of antenna manufacturers come along with new designs, run an ad or two, perhaps linger longer, then disappear. Almost always the pattern ran: A new super antenna that could be made for pennies was advertised at fantastically high prices, accompanied by fantastic blurbs for its performance. A few antennas would be sold, and the manufacturer would sadly discover that only antennas that had stood the test of time could sell in sufficient quantities to cover all costs. As a result of these scores of failures, 'orphan' antennas still pop up plaintively in 'Used Equipment' bargain columns.

From the moment Gotham made its first antenna, there has always been continued acceptance of Gotham antennas as the standard of the amateur radio field. We are very proud of the fact that every one of our beams is a full half-wave in element size, justifying the hams' faith in our basic design.

To sum up our present plans, Gotham will continue to manufacture fifty ham antennas at low, low prices. Our only new venture for the foreseeable future is a new low-cost marine radio-telephone antenna, which will bring an added measure of safety to mariners, due to a new efficient design. Literature is available.

And now to answer some questions: Why is the Gotham price so very low? Doesn't the low price mean a lack of quality? Answer: The Gotham price is low because we sell in quantities and make only a fair profit on each antenna. We do not add on a tremendous overhead and engineering charge. As for quality, we have always used the best materials, and every antenna is doubly inspected before shipment. Thousands of Gotham antennas are in use the world over.

Why are all Gotham beams of the Yagi type, all metal, and grounded at the center? Answer: To get the maximum strength for the minimum weight, to get maximum efficiency, and to avoid the use of wood, tuning stubs, traps, or other substitute devices, all of which are undesirable and unnecessary. In addition, grounded beams are lightning-proof and protect your home.

How do Gotham beams gain compare with higher priced antennas? Answer: No beam, regardless of price, can give more gain, for a given boom size, than a Gotham beam. Obviously, the more elements, the more gain. Our gain figures are published in our literature, and are available, free, on request.

What matching systems are available in Gotham beams? Answer: We use both the Gamma match for 52 and 72 ohm coaxial feed, and the T match for 300 ohm feed. These are tried and true matching systems, proven by thousands of hams, and extremely simple. No electronic equipment or measuring devices are needed. Everything is furnished.

How difficult is it to put a Gotham beam together? Answer: It's easy, and it takes only a few moments. No special tools are required for assembly and installation. Full, simple instructions are given, and all machining and cutting is done at the factory. Thousands of novices have successfully assembled and installed our antennas.

What is the difference between the Standard and the DeLuxe beams? Answer: The Standard beams in the 6, 10, and 15 meter bands used $\frac{5}{8}$" and $\frac{3}{4}$" tubing elements; the DeLuxe models for these bands use $\frac{7}{8}$" and 1" tubing. In the 20 meter beams, the Standard beams have a single boom, while the DeLuxe beams use twin booms. All 20 meter beams use full 12 foot booms. In the 20 meter beams and in the Twobanders and Tribanders, only $\frac{7}{8}$" and 1" tubing are used.

Is the Gotham aluminum tubing corrosion-proof? Is is strong? Answer. Yes, our aluminum has an 'aluminized' finish, both on the inside and outside surfaces, and is corrosion-proof. As for strength, our 6063T832 alloy has a yield strength of 40,000 lbs/sq. in.

Is it advantageous to use a Gotham Twobander or Tribander beam? Answer: Hundreds of these beams are in daily use. They are compromise beams, but by having each element a full half-wave, their gain figures are more than reasonably good. Of course a single three element beam on a single band will outperform a Tribander on that band, but the Tribander permits beam operation on three bands.

Are Gotham beams complete? Answer: Yes, we furnish everything — all tubing, fittings, castings where required, instructions — nothing extra to buy. We do not price an antenna piecemeal.

Do any Gotham antennas require guying? Answer: No. Our antennas have been designed to be self-supporting, due to the combination of tremendous strength and light weight. Whereas thin-walled or trapped verticals must be guyed, our 23 foot vertical antenna has come through hurricane winds without damage.

Do the Gotham verticals perform well on all bands? Answer: Yes, thousands of ham users attest to their efficiency on all bands from 6 to 160 meters. Reports of tremendous DX on low power are common.

Are mounts supplied with the vertical antenna? Answer: Yes, four mounting straps for side mounting are furnished with each vertical.

Are radials needed with a Gotham vertical? Answer: No, except in a few rare locations. 99% of the installations are done without radials.

Must a vertical antenna be mounted at any particular height? Answer: No, any convenient height will do. The higher, the better.

How do you change bands on a Gotham vertical? Answer: For 20, 15, 10, and 6 meters, the loading coil is not used. For 40, 80, and 160 meters, the proper portion of the loading coil is used.

Do you need a separate loading coil for each band? Answer: No, a V160 loading coil will cover 160, 80, 40, 20, 15, 10 and 6; a V80 loading coil will cover 80, 40, 20, 15, 10, and 6; a V40 loading coil will cover 40, 20, 15, 10, and 6 meters.

How much power can be used with a Gotham vertical? Answer: Anything up to the legal limit.

Is much space required for installing a vertical? Answer: No, only a few square inches are needed.

Can you give details on the loading coil used in the Gotham verticals? Answer: Yes, it is made for us by Barker and Williamson. It is 3" in diameter and exceptionally rugged. No other loading coil in the antenna industry has a higher Q.

Which do you recommend buying, a vertical or a beam? Answer: A beam is always preferable for use on any particular band. The beam cuts down QRM and amplifies the transmitted and received signal. The vertical has the advantages of small space, low cost, no rotator required, and multi-band coverage.

Why does Gotham make so many different antennas? Answer: To meet the needs of hams everywhere for a wide variety of antennas, on all bands.

What antennas are best for a novice? Answer: The V80 vertical and the S153N beam are the most popular choices.

Why should a ham buy a Gotham antenna? Answer: The tremendous progress of the amateur radio art makes it imperative that hams graduate from the antiquated antennas of years past to a modern antenna system. We will be glad to send, free of charge, our technical literature on our 50 antennas, or you can order for immediate shipment.

73,
GOTHAM

UNTIL FEBRUARY 1, 1959

10% PRICE SLASH!

TAKE 10% OFF WHEN ORDERING

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST

1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6–10 TWO BANDER.....	☐	$29.95
10–15 TWO BANDER.....	☐	34.95
10–20 TWO BANDER.....	☐	36.95
15–20 TWO BANDER.....	☐	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

☐ 6-10-15 $39.95 ☐ 10-15-20 $49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

☐ Deluxe 6-Element 9.95 ☐ 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30–50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
☐ Deluxe 2-El Gamma match	18.95	☐ T match	21.95
☐ Std. 3-El Gamma match	16.95	☐ T match	18.95
☐ Deluxe 3-El Gamma match	22.95	☐ T match	25.95
☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

☐ Beam #R6 (6 Meters, 4-El)....$38.95
☐ Beam #R10 (10 Meters, 4-El).. 40.95
☐ Beam #R15 (15 Meters, 3-El).. 49.95

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VP1SD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

☐ **V40 vertical for 40, 20, 15, 10, 6 meters. $14.95**

☐ **V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....$16.95**

☐ **V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....$18.95**

HOW TO ORDER. Send check or money order directly to Gotham or visit your local distributor. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

Address.....

City.....Zone.....State.....

great opportunities
for the right hams in

SALES

ENGINEERING

These rewarding opportunities with Raytheon enable you to capitalize on your technical background in an interesting sales opening with a wonderful future.

We need hams—or others with similar technical background. Previous sales experience or equivalent essential. Technical degree not necessary but the wider your technical knowledge, the better.

You will contact electronics companies, utilities and the government as a sales and application engineer for one or more of these products—transformers, voltage regulators, power supplies, ultrasonic machine tools, stored energy welders, knobs and panel hardware, marine and microwave equipment.

There are openings in several sections of the country.

What you earn depends on your experience, ability and performance. Base salaries from $500—$700 a month. Added incentive based on sales can *double* your earnings.

Your benefits include company car plan, group insurance, broad medical coverage, pension plan. More than 700 hams now enjoy rewarding work with Raytheon!

Please write fully, describing your background and experience, to Malcolm Dresser, Personnel Manager, Commercial Equipment Division, Raytheon Manufacturing Company, 100 River Street, Waltham 54, Massachusetts. Your reply will be kept in strict confidence.

RAYTHEON MANUFACTURING CO.
Waltham, Massachusetts

Excellence RAYTHEON *in Electronics*

Station Activities

(*Continued from page 96*)

Chest in Kenmore, N. Y.: W2AYH, W2VRG, W2OYI, W2WDO, W2GBX, K2MZL, K2VAW and W2CZO. They were all mobile on 2 meters. K2KWK/2 is active on 6 meters in St. Lawrence County. K2MLT has a 52-element 220-Mc. antenna up 45 feet in the air. He also is running 1000 watts on 6-meter s.s.b. The Rome RC elected W5-RWII/2, pres.; W2MSM, vice-pres.; K2LRV, secy.; and K2CSN, treas. W2BKC, the Squire of Corn Hill, has sold his big 500-watt rig and moved to a new QTH. He is now on the air with a new Apache and three new antennas. K2RIR reports that there is a 6-meter net every Mon. on 50.100 Mc. at 2100 with W2EJO as net control. K2RWV has a new Valiant. New 6-meter stations in Rochester include W2DOD, K2RHS and K2RGW. K2IXB reports a 6-meter net in Rochester every Mon. on 51 Mc. at 2100 with an attendance of 57 stations. K2DXD has been presented a W-Conn Award by the Willmantic Jaycees. Congratulations! K2EE led a discussion on Conelrad over the Erie County Emergency Net. W2PVI is going RTTY. W2GBX has a new Hy-Gain beam. K2UZJ has been working DX on 10 meters with his AT-1. W2GSJ is back on the air after a seven-year layoff. W2EMW reports his latest total as 229/213. RAWNY has inaugurated a WAS Award for club members only. Three-time winners are entitled to the W2SJV Memorial Trophy. K2QHR has a new HQ-170. W2RQF has four 1625s in GG for his s.s.b. rig. BPLs this month are K2SIL and K2GWN. Appointments: W2ZDL as OPS, W2RPQ as OO IV. The RARA held its annual Old-Timers Night in conjunction with the IRE and EIA. Traffic: K2SIL 638, K2GWN 517, K2RYH 429, K2MES 336, W2RUF 312, K2QHR 259, K2IYP 184, K2RTN 184, W2PVI 79, K2AOQ 77, W2YIY 70, W2FEB 62, K2JBX 61, W2COB 59, W2OE 59, W2ATC 52, K2QDT 52, K2UZJ 44, W2TPV 43, W2-PGA 37, W2GSJ 28, K2RWV 25, W2RQF 20, K2TQC 18, W2ZDL 18, K2RIT 17, W2RUT 14, WA2ABL 12, K2DG 9, K2BBJ 8, K2OBU 8, K2BCL 7, K2EE 6, K2JPM 6, K2HUK 5, W2CXM 3, K2GQU 3, W2EMW 2, K2EQB 1.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroozka, W3UHN—SEC: OMA, RM's: GJY, GEG and NUG. PAMs: AER and TOC. We regret to record the passing of ZHB, of Ellwood City. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3.985 kc. Third Regional (3RN) Traffic Net is in need of c.w. operators to help carry the traffic load for Western Pennsylvania in the National Traffic System (NTS. The Petticoat Operators of Six (P.O.O.S.) meets every Tue. at 2100 EST on 50.4 Mc. The Carnegie Tech. RC (NKI) has a newspaper, *Tech-Ham*, edited by 2WRD/3. ZWZ now has 78 countries confirmed on 10 meters. The Allegheny-Kiski Amateur RC has a new Triband beam and rotator. The Conemaugh Valley ARC's annual spaghetti supper will be held Jan. 10 at the C.W.V. Home. 2KGW and DPM were guests at the Semi-Annual Sideband Dinner held at the Parkway Hotel, Monroeville on Nov. 1. The Etna RC reports via *Oscillator*. NUG was guest speaker at the last meeting. TVW will give a talk on model railroading. LSS now is Asst. Radio Officer for Erie County. The W. Pa. School for Blind Children (K3AQE) meets Thurs. evening on 7194 kc. K3BTA recently received his General Class license. KBZ recently worked WAC. K3AJB now is WAS. The Western Penna. Mobileers meet every Wed. at 2000 EST on 29.360 Mc. The Westmoreland County Novice Net (WCNN) meets regularly on 3729 kc. at 2100 EST. JWZ worked KC4USB on 40 meters. ZHQ is an E.E. student at Pitt. The Cambria County C.D. Net participated in the S.E.T. exercises with WRE as NCS. IJA is a student at Pitt. YOS is attending Johns-Hopkins. K3AMO is attending Lehigh. K3AJB has a new 10-meter beam. Up Erie way: NMP received his commercial phone license while his son, KN3BTQ, passed the General Class exam; the RAE communications truck is now available for mobile use; VNC is sporting a new 35-ft. mast; HCP, from Headquarters, was guest speaker at the Russian C.Y.S. Club; the King-Fish Net is on 7275 kc. Mon. and Thurs. at 1100 EST. My thanks to QN for keeping me informed of activities up Erie way. The ATA of W. Pa. elected the following new officers: KQF, pres.; EOU, ZUW, UUH and UHN, vice-pres.; FEH, secy.; UL, treas.; ZJZ, OVM, NUG and AVY, directors. Guest speaker at the South Hills Brass Pounders & Modulators October meeting was HCP, from Headquarters. LXU and LXQ are doing a nice job of traffic-handling for he WPA Net. The WPA Traffic Net is in need of new c.w. operators. Let's all find time to call in and expedite the movement of traffic within our own section. Do your part as ORS appointees. This column welcomes news items from all amateurs in the section. Traffic: W3LXU 336, TOC 46, LSS 30, GJY 16, K3AGF 13, W3WRE 7, EPM 5, UHN 5, JWZ 2.

(*Continued on page 112*)

ANNOUNCEMENT!

We are pleased to advise that Central Electronics, Inc. has become a wholly-owned subsidiary of Zenith Radio Corporation.

The acquisition by Zenith materially strengthens Central Electronics' position in its field of amateur, commercial and military electronics, and will enable it to expand its operations substantially.

Wesley R. Schum who founded Central Electronics in 1950 will continue as Vice-President and the balance of the personnel will remain as before.

In the future you can expect the same satisfaction, service and leadership in creative engineering that we have delivered in the past.

Central Electronics' fine quality equipment is a natural addition to the Zenith family of high quality products.

NEW 100V EXCITER-TRANSMITTER

NO TUNING (except VFO), uses famous CE BROADBAND system. PRECISION LINEAR VFO—1KC Calibration. Single Knob Bandswitch 80 thru 10. SSB—DSB—AM—PM—CW and FSK. RF Output adjustable 10 to 100 Watts PEP. Meter reads Watts Input, Amps Output and Carrier Suppression. 2" RF Scope. Speech Level and Load Mismatch Indicators. Audio Filter — Inverse Feedback — 50 db Carrier and Sideband Suppression.

IN PRODUCTION SOON.....PRICE $595.00

SUPERIOR SSB GEAR

MULTIPHASE EQUIPMENT

MODEL 600L BROADBAND LINEAR

NO TUNING CONTROLS — CE BROADBAND Couplers in HIGH EFFECIENCY CLASS AB^2 using single 813. Easily driven to 600 Watts PEP Input 160 thru 10 by a 20A or 100V. Built-In HEAVY DUTY POWER SUPPLY — 45 MFD PAPER Capacitor. Meter reads WATTS INPUT, GRID DRIVE, RF AMPS, and SWR. Completely shielded — TVI suppressed — parasitic free. REMEMBER there is LESS than ONE S UNIT difference between the 600L and a 2 KW PEP job. .....PRICE $495.00

THESE MULTIPHASE EXCITERS PIONEERED AMATEUR SSB

MODEL 20A

MODEL 10B — 10 watts PEP. Plug-in coils 160 thru 10 meters. Perfect voice control on SSB—DSB—AM and PM — CW breakin. Carrier and calibrate level controls. 40 DB suppression.

Wired.....$179.50 Kit.....$139.50

MODEL 20A — 20 watts PEP. Bandswitched 160 thru 10 meters. SSB—DSB—AM—PM and CW. Magic eye monitors carrier null and peak modulation. Ideal for driving AB_1, AB^2, and most Class B linears.

Wired.....$279.50 Kit.....$219.50

MODEL 10B

Central Electronics, Inc.

1247 W. Belmont Ave. Chicago 13, Illinois

TOWERING HEIGHT
CRANKS UP and DOWN - FAST
TILTS OVER for CONVENIENCE
BUILT TO E.I.A. (R.E.T.M.A.) Standard TR-116.
E-Z WAY, 3-Section, Series X, are the tallest Ham towers in the world! 3-sections—crank up or down and tilt over for quick, easy maintenance and adjustment. In tilt position, less space is required than on many smaller 2-section models!
Sturdy, heavy-duty construction throughout. Models to fit any requirements.
Get set for real DX results—because with E-Z Way You Put Your Beam Where You Want It!
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CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA. RM: PCQ. PAM: RYU. EC Cook County: HPG. Section Net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. New appointments are EET as ORS and OBS. JSK is now mobile on 40 and 10 meters. GBT's son K9KZX is now General Class and is sporting a new Ranger. K9LON is a new Chicago General Class call. K9BIV is hunting DX on 6 meters. K9JIN is hte proud holder of a WAC certificate. GDI received his 200 sticker for the DXCC plaque. K9ERH is neglecting his traffic for his school work and is getting proficient in Russian. K9GDQ is sharing his rig with his brother, a new Novice with the call KN9PRW. MAK's new Mosley beam is getting DX FB these days. LNQ has resigned as editor of the Hamfesters (Chicago) *Ham Gab*. NN entertained VK6GH and his XYL while they were visiting the State. CSW and the North Central Phone Net handled 27 messages during the month and PCQ reports that the ILN passed 285 pieces of traffic in 26 sessions during the same period. LZE, K9AKS and UHD are DXing on the high bands. Our deepest sympathy to EU on the passing of his wife. TLC is chairman of the Starved Rock Radio Club's 25th Anniversary program. OKM has returned from a recent trip through the Middle East and is back working new DX. The Joliet gang had a mortgage-burning to celebrate the final payment on the club house. PNO is now on 6 meters with a Millen 90810 running about 100 watts. The DuPage County Civil Defense Control Center was officially opened Oct. 19 with many city and state officials present. It will serve as a model for installation of other c.d. buildings. JMY has been appointed the new EC of St. Clair County. K9EED was chairman of the Hamfesters Sweepstakes Contest. JJN is sure pulling in the hard ones on 14 Mc. K9JIO is working portable around the country with antennas on the hotel roofs. MQU reports that the St. Clair County Civil Defense Headquarters recently acquired a pair of 2-kw. generators for emergency operations. K9DYD, of Peoria, worked crossband recently on 144 Mc. and 200 Mc. into Aurora. EQC, of the same city, holds the present record on 220 Mc. with 750 miles into Elizabeth, N. J. Many of the various clubs of the State cooperated in the Simulated Emergency Test recently held and the results were gratifying. TUN and YJF are conducting radio classes in connection with the Boys Clubs. The ILN would like to have more Down-State members check into its c.w. net. The latest registered net is the Sangamon Valley AREC Net, with CAG as net manager. Traffic: (Oct.) K9GDQ 460, W9IDA 207, PCQ 203, FAW 146, DUA 140, K9MHW 134, W9TZN 119, MAK 100, K9ISP 89, W9CSW 42, SXL 33, JJN 29, UVM 21, RYL 16, K9IXK 14, ERH 10, W9JZK 10, K9JIN 9, BIV 4, W9NN 4, SKR 4, JMG 2. (Sept.) W9UVM 4.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: SNQ. PAMs: BKJ, KOY, SWD and UXK. RMs: DGA, TT and VAY. Net skeds: IFN, 0800 daily and 1800 M-F on 3910 kc; QIN, 1900 daily and RFN, 0700 Sun. on 3656 kc. UUU is the new EC for Vigo County replacing IHO, who is now Radio officer. K9MIQ is the new EC for Bartholomew Co. VQP has been appointed OPS. More than 20 clubs were represented at the fall meeting of the Indiana Radio Clubs Council. The RCA Amateur Radio Club was voted into the Council. The new IRCC seal was displayed and a talk was given by GPI. New officers are IHO, chairman; EHY, vice-chairman; FJI, secy.; CDW, treas.; QYQ, RTH, SWD and WTY, directors. The Rose Poly. ARC has been reactivated and the club station NAA is on the air again. EQB is now Radio Officer as well as EC for Johnson Co. PGO reports that the Huntington Co. RACES plan has been approved. GHK has been bitten by the DX bug, 116 so far this year. NTR reports a code class has been started at St. Meinrad. EHE has 16 mobiles in Porter Co. AREC. BKJ is active on DX with a new four-element beam for 10 meters. K9CFG has built an exciter for 220 Mc. VAY has issued QIN certificates to FJR, WID and WRK. QIN traffic was 282. IFN traffic, as reported by SWD, was 368. RFN traffic was 214, as reported by TT. K9GLL reports a traffic count of 76 for the IMO Six-Meter Net. The Indiana Sideband Net reports traffic of 75 and an average of 21 stations per night for the first month of operation. The net meets daily at 1830 CST on 3920 kc. KOY is PAM for the net. K9LJO is a new Tech. Cl. licensee and is on with a Globe Scout. NZZ and ZYK made BPL. The best of Seasons' Greetings and let's resolve to make 1959 the biggest year yet for ham radio in Indiana. Traffic. (Oct.) W9ZYK 554, NZZ 520, VAY 471, JOZ 314, TT 248, SVL 151, TQC 142, RTH 115, K9JDK 104, W9LYU 96, SWD 83, BKJ 79, FJR 78, K9IXD 65, W9ETM 59, GJS 52, MHP 50, K9AYI 48, W9EHZ 48, EGV 37, VNV 36, WID 36, K9GBB 35, W9YYX 33, SNQ 30, K9IHG 29, W9CDW 28, JBQ 28, WRK 26, BDG 25, DOK 25, MJJ 24,

(*Continued on page 114*)

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K9BSU 20, W9BUQ 18, K9HIO 16, JKK 15, W9IMT 13, IMU 12, QR 11, K9CFG 10, W9DZC 8, PPS 8, HUF 7, BDP 6, ENU 6, K9KBW 6, W9NTR 6, WAU 5, IGZ 4, K9LJO 4, W9GDL 3, NH 3, K9OCK 3, W9UXK 3, K9DWK 2, W9STC 2, YVS 2. (Sept.) K9AZK 96, W9QWI 30, SYM 14, ENU 7, K9IZO 5, W9ZSW 4.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAM: NRP. RMs: SAA, K9AEQ and K9ELT. New appointments: CCO as ORS and OO, RXJ as EC. The Northwestern Wisconsin Radio Club of Eau Claire, now in its 35th year, elected ZBY, pres.; DSP, vice-pres.; K9IBI, secy.; K9HDL, treas.; and K9ALP, act. mgr. The club is up to 70 members. IXF has a 30-ft. tower for a new Tribander and 2-meter beams. RQK is organizing a club at Northwestern U. DYG and K9ELT are new members of the A-1 Operators Club. K9GDF received a WAS certificate. WVRA club station NUW operated portable from Rib Mt. to collect election returns for the Wausau TV station's service area. Ex-SCM RQM now has competition. Son Jerry is now KN9-PQT. WSSN Net certificates went to K9CEF and K9-ESN. K9AQT now is a member of the Keesler AFB Club in Mississippi. CCO is back on the nets from Whitewater after 3 years of Navy life and visits to the VK, ZL, JA, DL and KG areas. A BEN certificate was issued to DTV. KQD now has DXCC No. 18 for the MRAC. PQA and K9CAN now have WAZ. K9IQO now is OBS on 50.6 Mc. at 7 P.M. Sun., Wed. and Fri. K9s GEI, KNW, LIM, GOK, KBZ, GAJ, GBK, W9s HDZ and NHE served as auxiliary mobile police in Fond du Lac on Halloween. The Wisconsin Rag Chewer's Net, WRN, has been reorganized and operates each Mon. at 8 P.M. on 51.1 Mc. K9EBO is manager. QJW is NCS for the 10-Meter Marathon County RACES Net. LST has a new 250-watt final on 6-meter s.s.b. Active on 2 meters in the Green Bay Area are GFL, LYX, OPA, IMQ, UMJ, VGL and KN9MOH. VCH and K9JZE have WAS. BPL certificates were earned by CXY and IKY. K9ALP is another stamp collector. Details on the "Talk Wisconsin" project can be had from the SCM. Season's best greetings and have yourself a time in '59. Traffic: (Oct.) W9CXY 1049, IKY 263, KQB 158, DYG 109, SAA 102, K9ELT 76, W9NQW 72, YZG 50, K9DTK 21, W9MWQ 20, K9LMX 16, ALP 13. W9CBE 13, SIZ 12, NLJ 11, QJW 11, GFL 10. K9CEF 9, W9VHP 9, K9IQO 6, W9-VIK 6, CCO 5, K9GDF 4, W9WJH 4, SDK 2. (Sept.) W9SIZ 5, WJH 4, SDK 2.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: KØJLW. PAM: YCL. PHC and KØHDA took their commercial exam. PHC came up with 2nd-class phone and HDA received his 3rd-class phone license. KØESO has a new Apache and SB-10 sideband generator. KØHDA is using a new Globe Champ 300. KØIQJ has changed to a DX-100. KØJLW is putting up a new beam. VAL is going mobile with a G77 and a 66 receiver. A new call in the Hankinson Area is KØPEO. KØGGL and KTZ are building s.s.b. exciters. A class in code and radio theory is scheduled at St. Francis Academy at Hankinson in the near future. KTZ and KØATK will be doing their share to get new hams properly prepared for tests. ATK is building up his c.w. proficiency. Both ATK and KTZ are prepared for emergencies with stand-by generators. Traffic: KØCNC 42, ADI 41, JLW 33, PZN 29, WØYCL 24, CAQ 18, KØKJR 9, GRM 6, WØIRN 6, KØIQJ 5, AJW 3, HLT 2, QYD 2.

SOUTH DAKOTA—SCM, Les Price, WØFLP—Asst. SCM: Gerald F. Lee, ØYKY. SCM assistants: FKE and NEO. SECs: YOB and GDE. PAM: SCT. RM: GWS. The South Dakota C.W. Net meets Mon.-Wed.-Fri. at 7:00 P.M. CST on 3645 kc. and reports 14 sessions, SCT 8, KØDYR 3, KØBMQ 3; QNI 99, high 10, low 4, average 7; traffic 14, low 0, informals 5, high 2. The South Dakota 75 Phone Net meets daily at 6:30 P.M. CST on 3870 kc. and Sun. at 9:30 A.M. CST and reports 35 sessions, GWA 4, KØDUR 4, EXX 2, YVF 4, SCT 21; QNI 828, high 6, low 0, average 2.4. The South Dakota 40 Meter Noon Phone Net meets Mon. through Sat. at 12:15 P.M. CST on 7225 kc. and reports 26 sessions, KØLXF 21, NNX 5; QNI 379, high 23, low 8, average 14.576; traffic 85, high 10, low 0, average 3.269; informals 50, high 6, low 0, average 1.923. EXX has turned the net manager-ship over to KØLXF. The South Dakota WX Net started Oct. 1 and reports 23 sessions, QNI 245, high 16, low 6, average 10.65; QTC 255, high 13, low 6, average 11. The South Dakota S.S.B. Net, with NEO and FKE as NCS, reports QNI 408, high 24, low 11, average 14; QTC 28, high 5, low 0. NNX now has a GPR-90 receiver. KØLXF has a new beam. EQV has been in the hospital. Jim Adams has returned from Japan to be stationed at the air base at Miles City, Mont. New calls are KØRRB, Redfield, and KØPAW, Marion. KØBMQ got a Viking I. KØRQY represents a new town on he net, Naples. The

(Continued on page 116)

GONSET

G-43

An entirely modern all-band Communications Receiver offers you FULL DOLLAR VALUE

A fine, new all-band receiver, offering the radio amateur or advanced short-wave listener, so many highly desirable electronic features . . . handsome industrial-designer styling . . . at a price that is—by the most careful point-by-point comparison—a bigger, better, dollar value.

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School of Mines and Technology has organized a radio club. Officers are SGM, pres.; KØDRF, vice-pres.; KØCMX, secy.-treas. The club operated a rig for the Parents Day at the Mines. Traffic: WØSCT 393, ZWL 214, KØBMQ 92, WØDVB 68, KØARF 64, AIE 20, WØFLP 20, ZLB 14, FJZ 12, KØKLR 11, WØBLZ 5, KØDHA 4, LXF 4, DUR 3, WØOFP 3, BQR 1, KØCMX 1, IAW 1, LXH 1, WØNXX 1.

MINNESOTA—SCM, Robert M. Nelson, WØKLG—Asst. SCM: Bob Schoening, ØTKX, SEC: TUS, RM: KØGCN, PAMs: QVR and TCK, KØACY, club station of Bethel College, St. Paul, is back on the air after a 2-year absence. A code and theory class has been started with 15 persons participating. The Mesabi Wireless Club for the Iron Range Area meets the 3rd Tue. of each month. New members are invited. Present officers are KØQCQ, pres.; KØKEE, vice-pres.; KØIZF secy.; and KØIUX, treas. This is an active group of young hams. The Willimantic Connecticut Jaycees has presented a "Worked all Connecticut" Award to KØALL, of Mankato. He is the first one in the Ø area to receive this award. WMA took eleven messages for the Midwest from the U.S.N. Ship *Lindenvald*, which almost sank in a bad storm off the coast of Greenland. KØGVS and WØKJZ made BPL. KØQBA is a new General Class licensee at Mountain Lake. KØMNY now has 46 states, with Arkansas and Utah to go. KØPML now has an all-band vertical antenna and an NC-57 receiver. FTN is back on MSN with a new Heathkit Apache transmitter. KØMGT built an electronic key and has installed grid-block keying in his rig. KNØRHK, at Duluth, runs a DX-40 transmitter and receives on an S-76. KØMAH has been appointed Assistant EC for Crow Wing County. A nice OO report received from LST indicates that he has spent a busy month sending cooperative notices to band-edge frequency violators. New EC for Beltrami County is TWG. KØGIY is now EC for Becker, Clay, Mahnomen and Norman Counties. The complete SEC reports from TUS each month show that the AREC is growing steadily in this State. If you are not an AREC member, join now! Traffic: (Oct.) WØKJZ 344, KØIDV 213, GVS 152, WØKLG 90, TUS 81, PET 65, KØKYK 63, ORK 50, GCN 48, WØWMA 42, KØEPT 36, MGT 36, WØDQL 30, KFN 28, KØPML 26, AEE 24, MIJ 22, WØOJK 22, BUO 18, OPX 16, UMX 15, KØJWK 14, WØOJG 14, QVR 12, TCK 11, ALW 10, KØDID 9, IZD 9, WØEMZ 8, LST 7, KØMNY 7, WØFGP 6, KØQBA 3. (Sept.) KNØQBA 9, KØOAV 3, PML 3, JWK 1. (Aug.) WØOPX 19.

DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR, PAM: DYL, RM: SZJ, ØJHY/5 has received his 35-w.p.m. Code Proficiency endorsement sticker. 7BED/5 recently acquired a new bride. We are very happy to announce that two stations made BPL for October: K5IPS and K5FJA. A new ham in Fort Smith is Jody Nelis, KN5SCC. We notice there is a considerable increase in the activity on both the Arkansas phone and c.w. nets lately. K5PYD was a recent visitor in Osceola. MZP has returned to 75 meters after being on the high frequency bands for the past few years. DUV is devoting most of his time to 6 meters and reports he is having a wonderful time. We had a grand time in the last LO Party but did not hear many from Arkansas. Hope you will join us next time. Some of you need to send in your appointment certificates for endorsement. Please send them in so as to keep your appointment in good standing. We invite you to support the local traffic and emergency nets. Traffic: K5FJA 503, IPS 221, W5SZJ 91, BYJ 80, DAG 52, UED 7, W7BED/5 4.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—CEZ made the BPL again with a traffic count of over 500 messages. He is active in LAN, RN-5, UTL and MARS. INL, EC for the Westside ARC, reports on the S.E.T. drill held in October with 18 AREC members and 2 Asst. ECs participating on 28.9 Mc. K5MMP reports a drill was held Nov. 5 with 26 AREC and 12 supporting members on 3.825 and 29.6 Mc. ML, who is active on 144 Mc., reports that FYZ is going strong on 144 Mc. and so is W5SUM. MXQ reports into LAN, RN-5, CAN and MARS. K5MXO urges c.w. stations all over the State to join LAN and make it an effective net. She is active in the C.D. C.W. Net each Thurs. night. K5LKC, OPS, reports that the Nitwits have formed the Ark-La-Tex Amateur Radio Club with a membership of 42 in Arkansas, Oklahoma, Louisiana and Texas. The club is planning a "Ham Day" at the Louisiana State Fair. EA still is going strong at West Monroe. K5DMA has been appointed OPS. New officers of the Central Louisiana Amateur Radio Club are K8BLO/5, pres.; Burton Dugat, vice-pres.; Dave Beck, act. mgr.; and K5MUU, secy.-treas. The Tulane Universiy ARC is being reactivated and your SCM had the pleasure of addressing the group recently. Plenty of good equipment,

(*Continued on page 118*)

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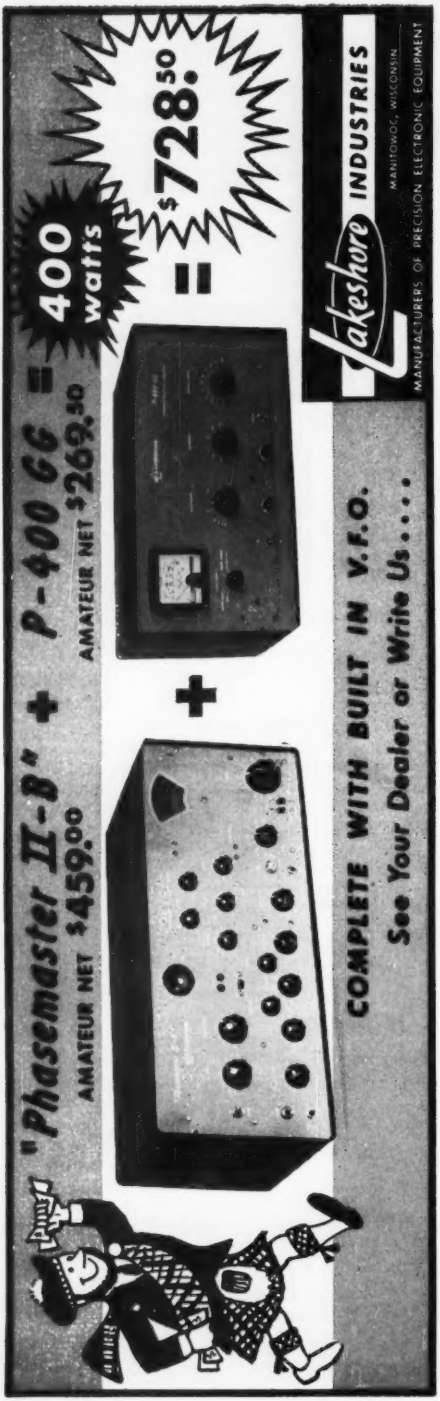

good quarters, new antennas and a wonderful source of traffic should make the club a success. Mail reports early. Check appointment dates. Traffic: W5CEZ 502, MXQ 215, K5LKC 32, DMA 12, W5EA 9, K5MMP 8.

MISSISSIPPI—SCM, John Adrian Houston, sr., W5EHH—K5CHZ reports K5JCD recently sponsored a picnic at Hattiesburg with some 26 amateurs and families present. Everyone enjoyed the get-together. K5DLN's Triband beam is up 60 ft. and is getting some DX. UXJ has a new three-element beam on 20 meters and is getting out real well with his Viking. K5HYO has a new Triband mobile whip to go with the new Elmac transmitter and Elmac receiver. He has been working out real well on the 10 and 15-meter bands. K5MFY is being heard much louder on 75 meters since he has been using a DX-40 and has his antenna some higher. K5HAR reports the Tom Bigbee Radio Club is being organized. KN5SHB has taken the Conditional Class exam. He hopes to be on the phone bands with a DX-100 soon. UTH has changed his QTH to Greenville. K5LEA has run down all the DX on 15 meters and is now trying 10 meters to see what he can get. Traffic: W5JHS 85, K5IHQ 28, W5RIM 15, K5HAR 14, W5VME 7, K5MFY 6.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: RRV. RM: NHT. PAMs: PAH, VQE, UOT and ZZ. Welcome to the Frye Amateur Radio Club, our newest ARRL Affiliated Club. Congratulations to W5RCF, VJ, NHT, EET and K4EJN for attendance of 75 per cent or more of TN (c.w.) Net sessions. Hats off to W5RCF on making BPL; PVD on OO reporting; K4KYL on OES reporting; RRV on his S.E.T. report; NHT, PAH and VQE on net reports. PL reports having been in the hospital three times but hopes to get on again soon. JVM and UVU report they are on the air with 6-meter mobiles. DTI says his DXCC count now is 90/82. TDZ reports the jr. operator has started walking. K4LPW says he is getting ready for the contest season. Traffic: W5RCF 992, W4OGG 332, NHT 156, VJ 112, IGW 98, K4JNK 70, LLB 42, W4UIO 38, JVM 37, PAH 31, CXY 20, TDZ 15, UVL 15, K4OUK 12, W4VQE 7, K4LPW 6, KYL 3.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: William C. Alcock, 4CDA. SEC: BAZ. RM: K4AIS. PAMs: GTC and K4MMW. V.H.F. PAM: K4LOA. S.S.B. PAM: NGN and K4HBF. K4LOA reports the KY6M net has dropped to local activity. All 6-meter stations are urged to support Hanks. Let's build a v.h.f. net in Kentucky. ECs BAZ, RHZ, NGN, TQD and SZL report on the S.E.T. K4CSH has been appointed net manager of the early session of KYN. Good luck, Al. K4KIN and JOP report major activity in school. K4PNA and KIS have a new Valiant. KKG has a new HT-33A. A new OO is K4QCQ. Traffic: K4AIS 358, W4BAZ 167, K4CSH 159, OAH 135, W4ZDB 102, SUD 74, RPF 68, GTC 64, OGY 56, K4WBG 48, W4KKG 46, K4CC 37, W4YYI 36, K4KIN 27, W4NGN 26, K4JOP 23, QCQ 23, W4HOJ 22, K4LHQ 20, QHZ 18, SBZ 18, W4MWX 17, CDA 14, K4SBL 14, W4SZB 12, SZL 11, K4HOE 9, QCW 9, W4ELG 7, K4KIS 7, KYZ 7, EMR 6, W4HNI 6, K4QCR 6, PNA 5.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: YAN. RMs: DAP, FWQ and OCC. No new appointments were made during October, but only because there were no applications. 1HHR advised me that NAN, of Kalamazoo, was the first Michigan Award winner in the "Worked all Connecticut" Contest (c.w.). This contest was sponsored by the Willimantic Jaycees. The Richmond (Michigan) Amateur Radio Club has become affiliated with the A.R.R.L. Following the custom started last year, the Central Michigan Amateur Radio Club, Inc. (Lansing) will award the Cosmo G. Calkins award to some deserving Michigan amateur early in 1959. Nominations from the section are requested. A note to FSZ will answer questions on matters related to the award. The new officers of the Genesee County Radio Club are GJH, pres.; IFK, 1st vice-pres.; QLZ, 2nd vice-pres.; BNN, 3rd vice-pres.; JAC, secy.; and QLX, treas. The club's 25th Anniversary Dinner held in October was a fine one. The Saginaw Valley ARA has started work on its new communications trailer. It will be fitted with communications and public address equipment for use in c.d., Red Cross and other activities as a public service. OCC operated K8JAL for 19 hours during the October S.E.T. to serve as Region IV Hq. OCDM, AUD visited many W4 friends during his October vacation. The Mason County RC provided communications for the Powder Puff Derby at the Manistee Airport. Season's Greetings to all. Traffic: (Oct.) W8QQO 216, OCC 195, YAN 127, FWQ 115, K8NAW 111, W8RTN 83, ILP 66, NOH 62, FX 61, JKX 48, AUD 47, K8HZU 43, BQD 33, DDN 31, AEM 30, GJD 30, W8SCW 26, TBP 23, DSE

(*Continued on page 120*)

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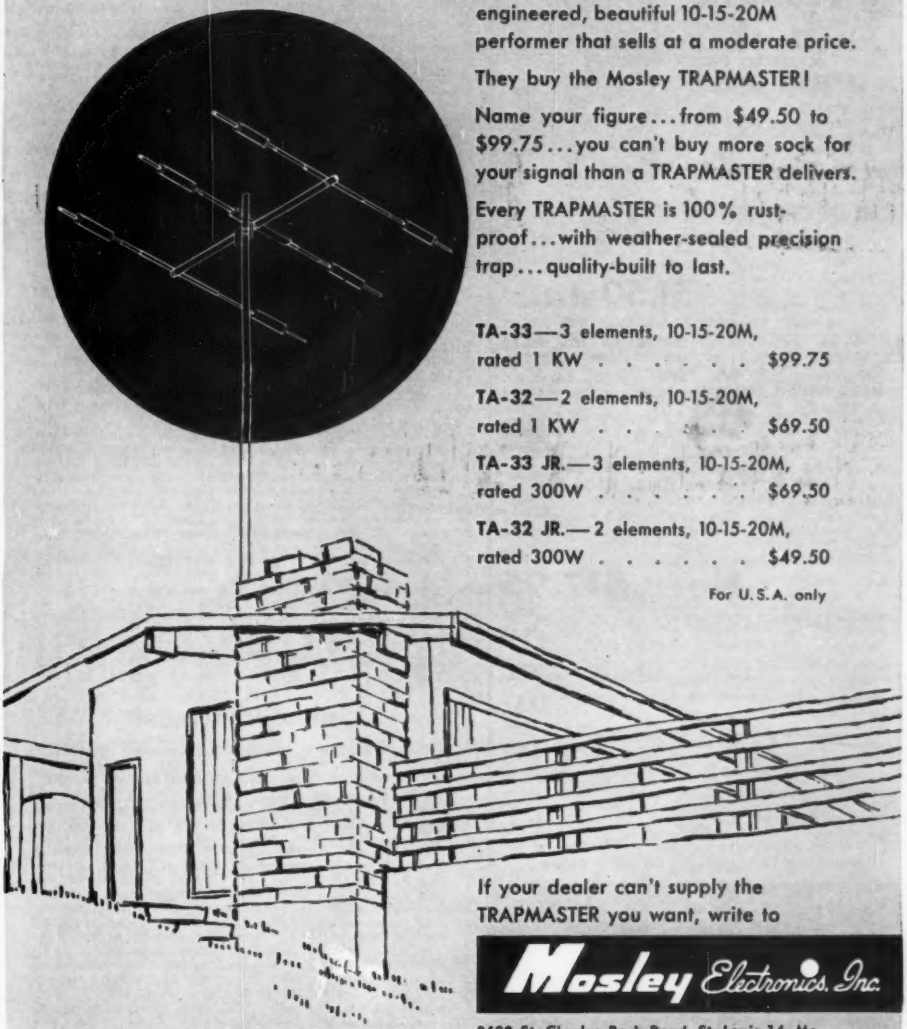

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FT-243 holders pin spacing ½" pin diameter .093

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MADE TO ORDER CRYSTALS

1001 KC to 2500 KC:

.01% Tolerance **$2.00**
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10 to 30 MC .005 tolerance ..... **$3.85 ea.**
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Compact, portable, in attractive metal carrying case with handle. Size: 4" H x 3" W x 6" D. Connects to any receiver to get 100 KC markers from 100 KC to 50 MC. Factory wired with two transistors, one 100 KC crystal, self-contained battery. Shipping weight, 10 oz. Add **50c** for prepaid parcel post.

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MARINE FREQUENCY CRYSTALS • All marine frequencies from 2000–3200 KC .005 tolerance **$2.50**
(Supplied in either FT-243, MC-7, or FT-171 holders.)

RADIO CONTROL CRYSTALS • 27.255 MC sealed crystals ½" pin spacing . . . specify pin diameter . . . .093 or .050! . . . **$2.50 ea.**

Stock crystals in FT-243 holders from 5675 KC to 8650 KC in 25 KC steps ..... **75¢** or 3 for **$2.00**

FT-241 lattice crystals in all frequencies from 370 KC to 540 KC (all except 455 KC and 500 KC.) **50c**
Matched pairs ± 15 cycles **$2.50** per pair.

200 KC Crystals, **$2.00;** 455 KC Crystals, **$1.25;** 500 KC Crystals, **$1.25;** 1000 KC Frequency Standard Crystals, **$3.50;** Dual Socket for FT-243 Crystals, **15c;** Ceramic socket HC/6U Crystals, **15c.**

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20, K8CKD 16, W8IUJ 16, K8GUU 9, W8WXO 9, VYG 8, FOV 6, EGI 5, SJN 4, K8IGI 3, W8HKT 2. (Sept.) W8AHV 16.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RMs: DAE and VTP. PAMs: HPP, HUX and HZJ. The University of Toledo ARC's 1959 officers are MQQ, pres.; ISS, vice-pres.; and PIA, secy.-treas.; with HEM as club station using a Viking 2, an NC-101X and an SX-16. MQQ received his Extra Class ticket. The Greater Cincinnati ARA's 1959 officers are ALW, pres.; QBJ, 1st vice-pres.; PKD, 2nd vice-pres.; TPJ, corr. secy.; LPC, rec. secy.; NCV, treas.; and MGP, editor of the *Mike & Key*. BOJ is now secy. of the Ohio Valley ARA. The Dayton ARA's *R-F Carrier* tells us the club placed fourth in ARRL'S January V.H.F. Contest. HB spoke on what makes a tape recorder tick and its why and how. ZOF showed how simple it is to align a receiver and to check your receiver for alignment and the club is planning code and theory classes. Toledo's *Shack Gossip* names BBO as its "Ham of the Month." The Columbus ARA's *Carascope* informs us '59 officers were nominated; the v.h.f. section named its 1959 officers as VOF, chairman: THU, vice-chairman; WRN, secy.; IOV, treas.; CPA moved out of town and QQ was appointed to fill in as a member of the Board of Trustees; DWP has a new beam and K8ANX has a new Tribander. The Springfield ARC's 1959 officers are DCJ, pres.; K8DEO, vice-pres.; K8JTL, secy.; IMP, treas.; and WXG, trustee. VYU is attending a Navy school. K8EKG is going to Akron U. K8CZT was elected president of the radio club at the Case Institute of Technology. Ex-ICP now is K8MDD. KYE and K8JZN have new Mosley 3-band beams and the latter has an HQ-170. K8BNR has a new 10-meter beam. Your SCM and UPB, Vice-Director and SEC, attended the Cleveland Amateuradio Convention where more than 700 amateurs were registered, with ET winning a Globe D8B transmitter TFW a Ham M rotator. UQS a Q multiplier. MTC a 6-meter beam and QBF a 2-meter beam. KN9MJT/8 is a new ham in Piqua. RJQ moved to California. The Cuyahoga County AREC helped to furnish communications in patrol duties on Halloween night with ADV, AEU, IMY, LHX, MBV, PVC, TTL, WBA, K8s ETF, IHC, KNH and LMY taking part. AREC members in many counties took part in the S.E.T. exercises. Henry County had FKD, JR/m, QCL, QZK/m, SMW and K8CRF participating; Stark County had AL, KYE/m, HEK, MJC/m, OJW, OYV, QMH, RTR, TTJ/m, K8s BXU, EML, HED and IDH taking part. LT now has a BC-610 on 10 meters. The Massillon ARC heard Mr. Scanlon talk about his recent experiences on the atomic submarine *Nautilus* and developments in the Navy's guided missile program and the club is sponsoring a certificate for working ten Massillon stations. DZB is resting after a spinal operation. OYL has a KWM-1-88B. The Ohio Phone Net and the Buckeye Net are looking for more outlets. UPH made BPL in October. K8IQJ received his General Class ticket. New appointees are TZO and K8EUC as OESs. Traffic: (Oct.) W8UPH 1385, AMH 271, QLJ 240, DAE 218, VTP 115, HXB 106, AL 75, CSK 69, K8DHJ 56, W8PMJ 43, K8DDG 41, W8LT 25, WE 23, K8YGR 21, W8RO 16, WYS 16, DTZ 13, IFX 13, IBX 12, LZE 10, ZAU 10, HZJ 8, DDW 7, K8EKG 7, HDO 7, W8BEW 6, K8HEJ 6, W8LGR 6, SMW 6, K8DZX 5, W8EEQ 5, HPP/8 5, K8MHO 5, W8BLS 4, ALZ 3, LOF 3, QCU 3, STR 3, BZX 2, K8EBO 2, EHE 2, HUY 2, W8LLY/8 2, LMB 2, STF 2, K8AJF 1, W8PZS 1. (Sept.) W8PMJ 16.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3605 kc. at 1900; NYSPTEN on 3925 kc. at 1800; IPN on 3970 kc. at 1600; ESS on 3590 kc. at 1800; ENY (emerg.) on 29,490 and 145.35 Mc. Fri. at 2100; MHT (Novice) on 3716 kc. Sat. at 1300. New appointment: K2YJL as OES. Endorsements: K2LKI as OPS, W2HO and K2GCH as EC. Over 500 attended the Hudson Division Convention in Albany on Oct. 11. K2YJL claims to be the only 6-meter ham in Greene Co. W2ANB now is receiving RTTY and soon will have a rig. Charlie Westervelt, chief operator at K2CWX, won a meritorious award at the convention for his service to patients at the V.A. Hospital in Albany. W2URP changed from an SX-71 to an SX-101 Mark III. The Schenectady Club entertained Division Director W2OBU at the November meeting. K2BGU is a new 6-meter station in Poughkeepsie. With a new 420-Mc. converter, W2LWI is building a rig and beam. K2CRB is converting his DX-20 to 6 meters. Also on 6 meters with a modified Knight rig is WV2AKK. Sufficient grid drive appears to be a problem with converted h.f. gear. K2KWK, mobile at St. Lawrence University in Canton, is looking for 6-meter contacts. Our

(Continued on page 122)

GONSET'S NEW G-11 . . .

ndreds of uses for the new Citizens' mmunicator: Carry in your car or use your home or office • sporting events • ning • hunting • camping • boating • o racing • skiing • hiking • on golf ts • club activities • spectator sports • tball games • country estates • base- ll games • communications around the me or country pr on farm • ranch onstruction pro pping • mining trols • oil and ga eological expe estry • park ma umbering • patching and co k lifts • use on fo arehousing • cy ergency comm v enforcement lroads • airports

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a complete 2-way radio station for use in the new Class "D" service on 11 meters

WHY? Now . . . F.C.C. assigns 22 channels in 27 mc range . . . virtually without restriction as to legitimate usage . . . can be business or pleasure. Any U.S. Citizen is eligible for license. No difficulty. Merely complete Form 505-D, (packed with equipment) and submit to F.C.C. No tests . . . no special skills . . . no examination

27 mc range offers better, more reliable 2-way communications posibilities than existing 450 mc Citizens Band...latter is essentially for "line of sight" operation.

G-11 equipment is precision, rugged, foolproof, dependable! Gonset G-11 meets every field and F.C.C. requirement, is a member of famed Gonset 2 and 6 meter Communicator family.

COMPARE THESE FEATURES WHEN SELECTING EQUIPMENT!

FULL CRYSTAL CONTROL . . . STABLE! NO TUNING!

G-11 offers highest stability . . . crystal tolerance .005% (F.C.C. requirement) both transmitter and receiver. No tuning — no drifting off channel. Adjustable squelch for muted standby operation. Full press-to-talk operation controlled by button on hand-held microphone.

POWER INPUT: Transmitter rated at 5 watts input, (maximum for Class "D" service) AM modulated.

OPERATING POWER: Two models available, 12 volts DC only and 115 volts AC only. Power supplies are built in.

COMPACT: 6¾" wide, 5¼" high, 6¾" deep.

G-11 CITIZENS COMMUNICATOR. Complete with press-to-talk microphone and transmitter/receiver crystals for one channel. Less antenna. 115 volts AC operation. . . . . Model 3303 . . . . . 149.50

Same as above except 12 volts DC. . . . . Model 3304 . . . . . 149.50

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Includes 50' transmission line, guy wires, screw eyes etc., read for installation.

BEAM ANTENNA FOR POINT-TO-POINT OPERATION Model 3302 . . . . . 39.95

3-element beam, forward gain 8 db. Front to back ratio 20 db.

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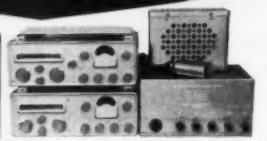

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SEC, W2KGC, soon will be enjoying a new QTH near Fishkill. The R.P.I. Club, W2SZ, now has kilowatt rigs on 75 and 80 meters. Governor Harriman reported on the license plate matter over the air from W2APF just before election. Let's hope the remaining states grant ham plates as a result of the New York State action. Results show the S.E.T. was well represented in Eastern New York. Congrats to all AREC members. Traffic: K2YTD 245, K2YZI 231, K2UTV 117, K2VTW 111, W2EFU 105, K2UYK 104, W2ATA 57, W2LWI 49, W2FVP 47, K2QJL 46, K2VCZ 45, K2LKI 40, W2SZ 39, K2YJL 36, K2CWX 30, K2RKY 24, WV2AKK 13, W2ANB 10, K2CKG 9, W2GTC 4.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2WFL. PAM: W2OBW. V.H.F. PAM: K2EQH. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 Mc. Tue., Wed. and Thurs. at 2000 EST. BPL cards were earned this month by W2KEB, K2QBW and K2VCO, the latter for the first time with a new net, GLI. This newly-organized net serves the section on 7250 kc. from 2100 to 2130 EST, Mon. through Sat. All interested stations are urged to check in or contact K2VCO for details. The V.H.F. Traffic Net handled 279 messages during the month. An excellent net bulletin was received from the NYC-LIPN. W2VDT received a gold certificate for his work in TCC. W2DRD is now running 200 watts. W2AEE is adding an HT-32 to the station. K2HVY is using a BC-221 for frequency measuring. A pair of old 45s are in use on 75 meters at W2LGK. K2SJP converted his Adventurer to 50 Mc. A new 6-meter mobile rig is under construction at K2TPU. K2VBL passed the Extra Class exam. K2OEG received "Worked Westchester County, N. Y." Award No. 11. Ditto K2VDR, who also passed the General Class exam. New officers of the NYURC are W1LBD, pres.; K2OVZ, vice-pres.; K2KIA, secy.-treas. and K2TQJ, exec. asst. K2MYS is running 10 watts on 6 meters. K2VUI has now reached 94 countries with his two-element Tribander and 50-foot tower. K2ADL is now using a DX-100. WA2BRG, ex-W1MGR, is now active with a Heath Apache and a Mohawk. K2JLR moved to Hagaman, N. Y., and keeps skeds with K2TSG and K2VIX on 50 Mc. W2CMM's XYL, K2TEX, passed the General Class exam. Officers of the newly-formed Patchogue HSRC are W2TNP, pres.; WV2CDP, vice-pres.; S. Rubino, secy.; and S. Livingston, treas. K2KJV is running 50 watts on 40-meter phone to a Globe Scout. New officers of the Mohawk RC are W2WPH, pres.; W2DKR, vice-pres.; K2IUT, secy.; and K2AAN, treas. K2ENC, K2IHQ and K2LGL passed the General Class exam. K2QXG is sponsoring an award, "20-K," for working 20 of the 23 "K" prefix countries outside the U.S. since Jan. 1, 1955. K2YBJ is active with a Ranger and an S-85. New officers of the Frog Hollow RC are W2JU, pres.; K2VHR, vice-pres.; W2BCD, secy.; and K2IOT, treas. New officers of the Central Queens RC are K2DZA, pres.; K2MMQ, vice-pres.; KN2SHQ, treas.; KN2UPS, corr. secy.; and K2TPU, rec. secy. The Long Island 6-Meter Net has a membership of 120 with 60 per cent active mobile. K2EFX, K2VIX and K2YBW are operating s.s.b. on 50 Mc. K4GG is the call now used by ex-W2GG, your SCM's OM. It is a pleasure to report that N. Y. State amateurs will be able to obtain call letter license plates in 1960. Our thanks go to W2AAO, who worked with much perseverance for many years in this endeavor. Season's greetings to all and best wishes for 1959. Traffic: (Oct.) W2KEB 3818, K2QBW 708, W2VDT 371, K2VCO 217, W2DRD 140, K2YBJ 137, K2IRS 100, W2AEE 78, K2HVY 70, K2SFS 56, W2DUS 51, K2LCM 51, W2EW 50, K2KJV 43, K2MYS 40, K2LDG 27, W2JBQ 25, KN2KVL 25, K2GB 21, W2PF 17, W2OME 15, WV2BAN 14, W2GP 14, K2VUI 12, K2IFZ 11, W2LGK 10, K2LVS 9, K2RJO 9, K2GFZ 8, W2IVN 8, K2MEM 8, K2SJP 7, K2PFH 6, K2RDP 6, W2HNG 5, KN2RBW 5, K2CQP 4, K2DVT 4, K2QQH 2, K2TPU 2, K2CMJ 1, K2VBL 1, W2ZRA 1. (Sept.) K2YBJ 94, K2DVT 55, K2LVS 24, W2AEE 23, W2JBQ 23, W2DSC 18, W2EW 18, WV2BAN 17, K2MYS 11, W2OME 11, K2EQH 9, K2GB 8, K2VUI 4, K2KRJ 2, K2KSP 2, K2OWD 2, K2RUP 2, WV2BHI 1, K2LDG 1, KN2RBW 1.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: W2IIN. PAM: W2VDE. V.H.F. PAM: K2KVR. RM: W2RXL. The New Jersey C.W. Net (NJN) meets on 3695 kc. at 1900 daily, the New Jersey Phone Net (NJPN) on 3900 kc. at 1800 daily except Sun. At a meeting of NJN on Nov. 1, W2RXL was elected net manager for 1959. W2HDW, present net manager of NJN, reports 31 sessions were held with an attendance of 525. K2VAB was tops in attendance, checking in on 28 sessions. W2RXL was our hardest worker. Karl was NCS and/or regional representative on 15 sessions. W2EWZ was the first New Jersey station to receive the

(*Continued on page 124*)

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Antenna weight	53 lbs.
Longest element length approx.	34' 5½"
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3 Element, 7 db on 10 Meters; 2 Element, 5.5 db on 15 Meters; 2 Element, 5.5 db on 20 Meters; Capacity, 3 KW, 100% AM

By actual on the air comparisons, has out-performed so-called 3 element tribanders! NO COMPROMISE, full size "Tri-Band" array precision tuned and matched to provide hi-performance, clean uni-directional pattern on 10, 15 and 20 meters.

Easy to follow fool-proof calibration chart supplied. Antenna easily assembled (approx. 1 hour) to the frequency of your choice for outstanding "Tri-Band" performance, without fuss, bother or formulas!

SPECIFICATIONS:

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- Gain 5.5 db on 15 and 20 meter; 7 db on 10 meters.
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Bandswitching: 6 & 2 Meters

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On Both 6 & 2 Meters:
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All RF Stages are metered. 52-72 ohm coaxial output matches all beams and most doublets. Variable antenna loading control. Single switch bandswitching. Four stage RF section allows straight through operation. Harmonic and TVI suppression. Adequate reserve power for operating accessories from auxiliary socket on rear chassis apron. Provisions for operating 110V changeover relay. Suitable for use as mobile transmitter: provisions for plug-in mobile power supply. Forward Look Cabinet. Exclusive: New Duo Band Final eliminates switching for greater efficiency.

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and Introducing Globe's New
VFO 6-2

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Especially designed for driving the Hi-Bander, and similar transmitters for 6 & 2M. King size 7" tuning scale. Perfect zero beat with exclusive bandspread control. Built-in, well-filtered power supply with voltage regulation. Completely temperature compensated. Calibrate switch for zero beating signal frequency without turning on Xmttr. Approx. 50V RF output. Plugs directly into Xtal. socket of Xmtr. 13:1 tuning ratio. Percentage drift: — .003% on 6M, .006% on 2M.

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Perfect Companion . . . for the Perfect Pair!
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Pennsylvania Keystone Award, all contacts on 7-Mc. c.w. The Watchung Valley Radio Club's new officers are K2DN, pres.; W2CCY, vice-pres.; W2UFQ, secy. K2ZHK reports the New Jersey Slo Speed Net had 23 sessions with an attendance of 42 and handled 73 messages. (3748 ke., 1830 EST). K2DDM, W2MXU, W2CVW and WV2CHN assisted Auxiliary Police with communication on Halloween "picket" nights. W2GVU was senior escort officer for the Dept. of Army tour of senior foreign signal officers. K2VNL reports the New Jersey 6-Meter Net (NJ6) held 9 sessions with an attendance of 141 and handled 36 messages. W2SXV now is in Hightstown. W2BVE worked KL7 and KH6 with a DX-35. K2JTU is active on NJPN and MARS. Traffic: (Oct.) W2MLW 284, K2YBC 262, W2RXL 218, W2KFR 122, W2ZVW 88, K2VAB 80, K2ZHK 73, K2QYI 68, W2ANG 61, K2MFF 58, W2RZO 38, W2OXL 36, W2BRC 32, W2EBG 25, W2EWZ 19, K2VNL 18, W2CVW 6, K2VNK 6, W2CJX 4, W2NIY 3, W2WOJ 2, W2BVE 1, (Sept.) W2ZVW 278, K2YBC 219, W2MLW 100, K2GIF 83, W2RXL 82, K2VAB 80, K2QYI 38, W2KFR 33, K2VAC 30, W2BRC 26, W2BVE 25, W2OXL 16, W2EBG 15, W2DRV 14, W2VMX 10, W2CFB 9, K2KUR 8, K2MFF 8, K2VVL 7, K2VNL 6, W2NIY 5, W2CJX 4, W2CVW 4, K2RPZ 1, W2WOJ 1. (Aug.) W2BVE 385, W2RZO 265, W2KFR 237, W2ZVW 173, K2QYI 138, W2MLW 126, W2RXL 86, K2ZMO 65, K2VAB 64, K2ZHK 42, K2PSM 39, K2YBC 38, W2GRD 29, W2BRC 25, K2MFF 24, W2EWZ 21, W2EBG 18, W2VMX 17, K2KVR 8, W2RON 8, W2OXL 7, W2CVW 5, K2PSX 5, K2VNL 5, K2BWQ 4, W2CJX 2, K2PIM 1.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—The Fairfield High School Club now has a complete emergency set-up consisting of a fixed station and a portable unit. The AREC group in Story County helped the Ames Police with its Halloween patrol. KNØQWM and QVZ are now General Class and KNØRXL is a new Novice in Ames. New appointments: KØAGJ as OBS, BLJ as ORS and OID as EC. Renewals: LGG as ORS and NWX as EC. KØOAH has a Johnson 500 and a cubical quad antenna. IGU and IGX have a new Tri-band cubical quad. The Burlington Club is conducting code classes under the direction of QVA. YWW reports the Ottumwa Club is being reorganized and also is giving code lessons. New officers of the Campus Radio Club in Ames are ZMU, pres.; UEZ, vice-pres.; KNØGND, secy.; and KØHFT, treas. ZMU's station in Ames has the call KØRZO. BDR visited the Fort Dodge Club. The three clubs in Sioux City have combined to form the Sioux City Amateur Radio Assn. The Story County AREC has a net consisting of Novices only. VQX got a nice write-up in the *Dubuque Telegraph Herald* about his AREC activities. Traffic: (Oct.) WØBDR 2489, SCA 2013, PZO 1315, LGG 837, GXQ 273, KØCLS 218, WØNYX 203, LCX 160, DVL 151, QVA 124, JPJ 114, KØMMZ 97, BLJ 89, WØNGS 89, KØMIB 80, EXN 74, WØSLC 63, KØIQB 47, KAQ 41, AUU 36, WØUTD 32, VQX 31, VWF 29, KØDPT 23, WØCGL 21, PTL 20, KØIGU 18, GBB 14, JGM 13, WØLSF 12, ADB 11, CYL 11, EDQ 11, UHO 10, YI 10, KØRZO 9, WØZMU 9, COD 7, RQA 7, KØBRE 6, WØIO 6, UTX 6, YDV 6, KØHBD 5, IHC 5, AGJ 4, GOQ 4, HFQ 4, WØEEG 3, KØLKE 3, KBX 1. (Sept.) WØRQA 25, BTX 12, KØCYF 9.

KANSAS—SCM, Raymond E. Baker, WØFNS—RM: QGG. PAM: LEW. V.H.F. PAM: ZJB. The QKS 8S Kansas C.W. Net resumed operation Nov. 1 and is on 3610 ke. Tue., Thurs., Sat. and Sun. at 1930 CST. This was in answer to many requests that this net be reactivated. WIZ has a new Heathkit SB-10 in operation. KØJID has a new Globe Champ transmitter in operation. KØAYS now is in the lead on WAK with 85 confirmed. The LARC e.d. mobiles (Lawrence Amateur Radio Club) met with city officials regarding the handling of local emergencies and also assisted the local law enforcement officers on Oct. 31 as lookouts for unnecessary vandalism. Kingman hams FHT and OCU received praise from the chairman of the Kingman County Diamond Jubilee for their fine work in handling traffic. The *Ham Monitor* is doing very fine covering club news and happenings. The *Midwest Relay* is doing nicely in covering Traffic Topics. New ORS appointees are IFR and KØIQA. New OPSs are UTO, FHT and VUI. GJG is the new EC for Cass, Salina, Zone 14, Russell, Lincoln, Ottawa, Ellsworth and Morris Counties. Traffic: BLI 667, WØOHJ 663, TOL 589, FNS 464, IFR 186, UOL 181, QGG 114, SAF 110, KØIR1, 72, IQA 62, WØABJ 49, KØKMZ 39, WØTTG 35, KØBIX 34, WØUTO 34, SYZ 32, LEW 29, WIZ 27, KØBXF 23, WØFCE 16, FDJ 14, KØHVD 14, JTW 12, WØVUI 12, KØEQY 11, WØFHT 10, KØEFL 9, WØUWN 8, ASY 6, KØJID 4, WØMXG 2.

(Continued on page 126)

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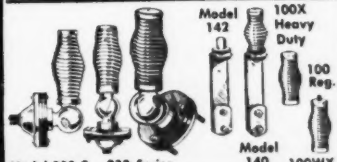

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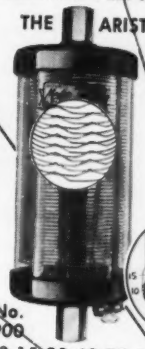

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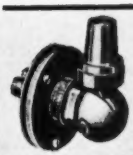

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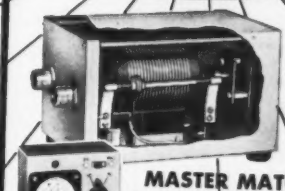

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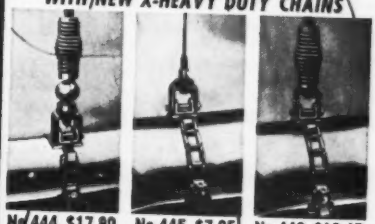

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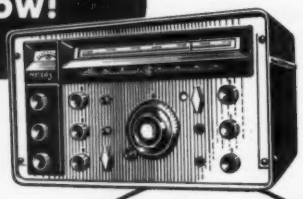

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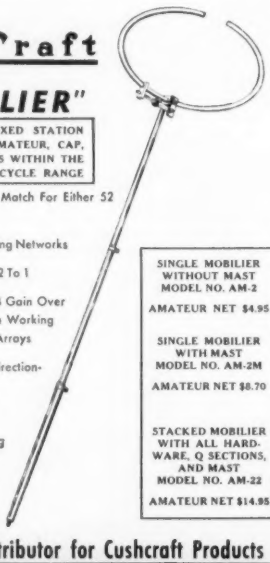

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MISSOURI—SCM, James W. Hoover, WØGEP—SEC: BUL. RMs: OUD and QXO. PAMs: BVL and KLQ. Net reports: MEN, 11 sessions reported; QNI 333, QTC 97; NCS, OHC 5, OMM 5, BUL 1. MON, 54 sessions; QNI 343, QTC 204; NCS, OUD 41, RTW 7, GBJ 5, ARO 1. KØLGZ is NCS for the Sundown Novice Net which operates on 7152 kc. at 1800 CST. ECE is home after a four-month absence for CAA school and vacation. OVV has a new 40-meter antenna. New licensees in Dixon are KNØQVT, KNØQVU and KØEZG. CZE has a new G-66B and an AF-67 mobile installation. TDS won a mobile hunt on 6 meters when he found KØABA, dressed as a woman, pushing a Communicator III in a baby buggy. The hunt was sponsored by the Midwest V.H.F. Association. TAF worked South Africa on 6 meters. KØHIM is working all bands with a DX-20, a VF-1 and an S-40. KØOJC has a new all-band trap antenna. OOT is on leave from the DEW Line where he operates as KL7OOT. When WNU and KØMRB became parents of a new boy, KØMRB operated from the hospital on 6 meters. W7DDK/Ø, KØJYX, KØHOA and KØLIN had an antenna-raising party for KØONK. TOL and eight of the Nebraska gang presented KØONK with a new Vibroplex bug. IFC is on 220 Mc. WFF is using a home-made electronic key. Traffic: (Oct.) WØCPI 566, KØONK 286, KBD 250, WØBVL 188, UXT 133, OUD 115, ARO 100, KIK 88, VPQ 80, GBJ 75, VZB 75, KØHHG 59, WØRTW 52, OVV 51, WFF 50, PME 35, KA 31, BUL 23, KNØRND 20, KØLRG 19, LGZ 16, OJC 14, WØGEP 11, KØCFY 8, HIM 7, IFM 7, IHY 7, WØVFP 6. (Sept.) WØBVL 53, VZB 35, KØLRG 29, WØOVV 20, KØLNQ 16, IFM 14, LGZ 7, WØEPI 5, KØDGT 4.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Nebraska 75-Meter Emergency Phone Net reelected MAO as net manager for 1959 and reports QNI 436, QTC 64 and that two new members, KØJZZ and UJX, were added, making a total of 35 on roll call. The Nebraska Slow-Speed Net reports QNI 166, QTC 93. There are eight stations on roll call and all who can are invited to take part in this net. The Morning Phone Net, reported by KØDGW, had QNI 672, QTC 191. The Western Nebraska Net reports QNI 597, QTC 64. The Nebraska C.W. Net, reported by ZWG, had QNI 263, QTC 106. The Nebraska nets are now getting started for a good winter session and all who can are urged to take part. KØKUA announces that code practice is at 1900 daily except Sunday. The No. Platte Club attended a joint meeting with the Wheat Belt Club at McCook Oct. 12. ZOU reports the Blue Valley Club is sponsoring a code and theory class. A meeting was held at Fremont Oct. 26 to arrange for a State Convention in 1959. Everyone should get behind this movement for a real good Nebraska State Convention. Traffic: WØMAO 160, KØIJW 151, WØZJF 149, NIK 66, ZWG 66, ZOU 51, OKO 47, KØBDF 44, WØEGQ 44, KØKUA 44, MRS 33, WØBOQ 28, KDW 27, KNØQVM 24, KØHKI 18, WØOCU 16, LJO 9, VOV 9, VEA 9, VZJ 9, HOP 8, KØELU 7, KJP 6, WØLJF 6, URC 6, VGH 5, AFG 4, KØDFO 4, KOK 4, WØSPV 4, QKR 3, KLB 2, KØLXS 2, MTI 2, SPK 2, KFY 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, Mon.-Sun. 1800 and 2130 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640. AW, YBH, NJM and K1AQB made BPL. The Southington ARA elected K1CSY, UCA, GVT and GVZ at its annual banquet. KYQ reports CN handled 760 messages during 31 sessions, including 285 on the second session, with an average of 25 messages and 15 stations per session. The new Sunday session shows promise with an average of 12 messages each Sunday. QNI honors go to GVK, RFJ and OBR. ZZK has a 229/221 country total. GVZ made DXCC. The Middlesex ARS monitors 29.580 kc. daily. YBH advises CPN handled 477 messages during 31 sessions with an average daily attendance of 30 stations. High QNI goes to K1BEN, DAV and FHP, 31; K1ACC and YBH, 30; K1AQB, DHP, MDB and KLK, 29; MWB, TVU and VIY, 28. BDI, RBF and OUG are active on RTTY in Connecticut. KN1IWM is active on 2 meters. K1AZG has a new 2-meter beam. K1BEJ has a new SX-101. WHL reports the 6-Meter Net handled 25 messages during October with an average of 15 stations per session. K1KAC and K1BOI, husband-and-wife team, have a new sixteen-element 2-meter beam. K1CRQ added Illinois and Florida to make it 17 states on 2 meters. MWB is back on 2 meters with a new ten-element beam. K1AAE has a new Heath VFO plus a vertical antenna. K1DYQ and K1IOW are new Generals in Norfolk. K1BML reports good results with his new vertical antenna. FHP reports CVN handled

(Continued on page 128)

IMPORTANT NEW BOOKS

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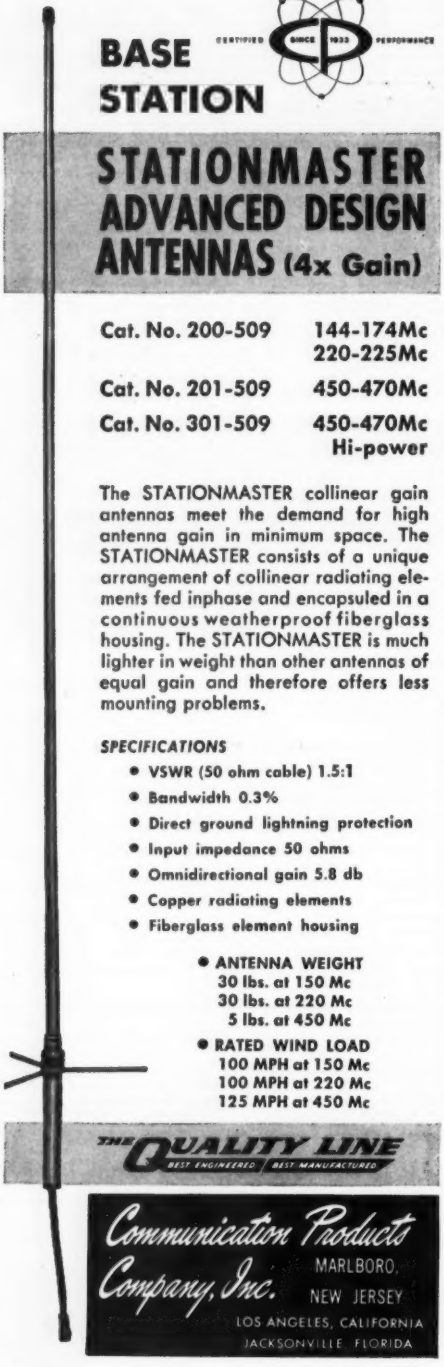
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16 messages during 13 sessions with an average of 9 stations. High QNI goes to K1BMM and K1BML, 12; FHP, 11; K1DDY, 9 and JZA, 8. Section net certificates were awarded to K1AQE, K1HMU and JZA. K1CKZ has 18 states on 6 meters using a Globe Scout 680A and an HQ-110. KN1JHA has a new jr. operator. KN1DWL and KN1DWM dropped the "N." KN1IFO is a new Novice in Meriden. YNC and RAN were first and second for Connecticut in the September Frequency Measuring Test. K1BEN reports successful participation in the S.E.T. by the local AREC group. KN1IJX is a new Novice in Southington. KLK made WAS. LGE contacted XE1GE on 6 meters and was heard in England. VWP acquired a Viking II to power his 6N2. HYF is back after a year in Florida. New appointments: HYF as ORS, K1BHM as OO. YBH renewed his OPS and OBS appointments. Reports received: SEC from EOR; OO from CDM, DHP, MBX and RAN; OES from K1BML, K1CKZ, FVV, KLK, LGE, MWB, VWP, YOL and ZTT. Traffic: W1AW 2032, YBH 1002, NJM 801, K1AQB 645, W1QJM 477, K1BEN 392, W1KYQ 378, TYQ 274, EFW 245, TUW 227, ULY 169, GVK 142, CUH 131, LV 93, BDI 67, K1ACC 66, W1KLK 66, OBR 60, FHP 51, K1DHU 35, W1VIY 29, FWM 28, MWB 23, K1CKZ 21, W1DHP 21, K1AQE 18, W1RFJ 15, GVJ 12, GIX 10, ZUQ 9, HAT 6, K1CAK 5, DPL 5, W1KAM 5, YOL 4, K1BHM 3, BML 3.

MAINE—Acting SCM, Charles F. Lander, W1QJA—SEC: QJA, PAM: VYA, V.H.F. PAM: JMN, RM: EFR. Traffic nets: The Sea Gull Net meets on 3940 kc, Mon.-Sat. at 1700. The Pine Tree Net meets on 3596 kc, Mon.-Fri. at 1900. The Barnyard Net meets on 3960 kc. at 1900 Mon.-Sat. Penobscot Co. Headquarters is installing radio equipment after putting on a new paint job for the Nov. 11 Parade. K1DMO and W1YTO have dropped the "N" from their calls. K1DUI is a new mobile on 10 meters. K1DXC also is installing one. FNT is now a W4 on Anna Maria Is. off Sarasota. W1MJO is now W4MJO. Other transplanted Maine boys are 4BU and 4BL. AE is leaving Peaks Is. for Baltimore and points south. UDD and his XYL Gladys, K1ADY and EXD, the OM, spent a week end with AE at Peaks Is. and came back well upholstered with lobster. In a recent sojourn to a YL jamboree at ZEN's Mary, K1ADY, literally blew her top! That is, she lost the top of the Caddy en route to Massachusetts but the mobile signal still was Q5. The Portland Amateur Wireless Assn. is engaged in a worthwhile humanitarian project of trying to obtain funds for a polio victim, Herbert Merrill of Scarboro, who is awaiting his ticket. Merrill has devised an ingenious maze of relays by which he can operate his lights, phone, recorder, hi-fi and a loud speaker system for calling his wife when needed, etc., all done by *one toe*, the only mobile part of his body except a very slight movability of his head. He has a receiver but it is planned to purchase a transmitter for him. Any ham who cares to help this chap to get on the air should contact Al Hodson, W1BCB, 370 Capisic St., Portland, Me. Traffic: W1GPY 117, CEV 107, ZME 107, QJA 106, UDD 85, K1AKO 83, BDQ 77, W1FD 56, K1BXI 41, DWQ 40, DPM 31, BYE 11, DLP 10, W1EPN 10, LWD 10, BX 7, K1AIF 2.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: WXC and K1GRP as OBSs, UOP as OO, K1BYL as ORS. EHT moved to Wayland. OJM, HKK and TEJ are on 75 meters. LSR has a Gonset III. Heard on 2 meters: KN1s HBA, HSI, DXO, IWS, K1IZF and W1DJI. New officers of the South Shore Club are TUP, pres.; K1DNY and MRL, vice-pres.; YVV, secy.; MME, treas. LGO is busy at school. ETH has a vertical up for 15 meters. The Braintree Club had an auction with MME doing his stuff. NTK has a Valiant and a three-element beam. 4VQZ, secy. of MX, says the club has over 20 members and new rigs for 10 and 15 meters. ZCH is active again. Many c.d. groups were out on "Operation Halloween." K1BUF has her CP for 30 w.p.m. K1DIO is working DX. BB is getting ready for the 160-meter DX Tests and will have a rig for his Maine farm. K1DJG was in the CD Party. AUQ is busy at work. AOG has a Globe Champion. ZDN has a Viking II. TZ is working on a fund for GFW. K1DBY has a DX-100. FJJ and WK have new beams. The Framingham and Waltham Clubs held auctions. The Framingham Club held a meeting at Sector C.D. Headquarters with QVK as Radio Officer. ZNG is working on gear for 10,000 Mc. More calls on 6 meters: K1s AKA, ALA, COB, CPV, DCI, DFC, DIX, EKY, ELA, ELO, W1s BCJ, FJE, FY, IVD, KNR, KXD, LUJ, MTP, TWN, UZY and YXX. The Malden Club had an auction. K9APE is mobile on 6 meters. The T-9 Club met at Larry Stone's QTH. K1IDB is chief operator at K1USA. CTW says he is working on a v.h.f. rhombic antenna up in New Hampshire at IQD. UIR has a rig for a two and 44-element

(Continued on page 130)

Transistor Power Supplies* and Components

*Complete Units

D SERIES (Standard)

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at ½ selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

Size: 4⅜" x 3¼" x 1⅛" Wt.: 10 oz. 6- or 12-V Input: **$39.95** 24-V Input: **$61.95**

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4⅜" x 3¼" x 1⅛" Wt.: 14 oz 12-V Input: **$57.50** 24-V Input: **$79.50**

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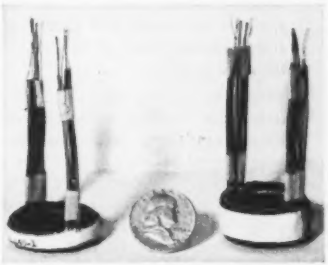

H SERIES

H-6-450-1	Input: 6-VDC. Output: 450-VAC center tapped...450 and 225 VDC from bridge rectifier...45 watts.
H-14-450-12	Input: 12/14-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...55 watts.
H-28-450-15	Input: 24/28-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...65 watts.
H-6-100-125-150-D	Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.
H-12-100-125-150-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.
H-24-100-125-150-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs.). 1-10 units: **$16.00** ea. With Encapsulation (3 ozs.). 1-10 units: **$18.50** ea.

HD SERIES — 2000 CPS

HD-14-225-300-2-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.
HD-28-225-300-2-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$18.50** ea.
With Encapsulation (4½ ozs.). 1-10 units: **$21.50** ea.

HDS SERIES — 2000 CPS

HDS-14-225-300-3-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.
HDS-28-225-300-3-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$21.50** ea.
With Encapsulation (4½ ozs.). 1-10 units: **$24.50** ea.

400 CYCLE SERIES

14-115-1.5-400	Input: 12/14-VDC. Output: 115-V at 1.5 amp.
24-115-1.5-400	Input: 24/28-VDC. Output: 115-V at 1.5 amp.

Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.). With Encapsulation (16 ozs.). Per Unit: **$76.00.**

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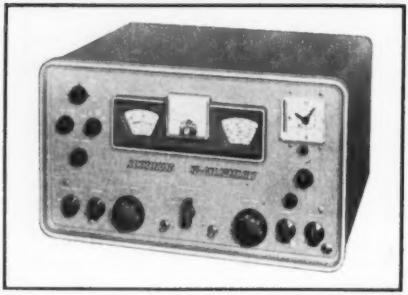

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beam; a 2-meter net is in the making so give him a hand on this. The North Shore Club meeting was well attended. AWA made BPL. MIX got his WAMC. K1CMS and ILA took a trip through New Hampshire, Maine and Canada taking colored movies. Net certificates have been issued to K1BUF, DIY, MIX, DTB and K1BYL as members of the Eastern Mass. Net on 3660 kc. at 1900; also to those on the 6-Meter Cross-Band Net on 50.85 Mc.: HBB, FY, KXT, HGO, VOU, SZV, JGR, K1s EGN, DIO, AII, ILA, IKX, HSV, ELA. UXW is on 10 meters. KYC says a radio club has been started at the Acton-Foxboro Regional High School. The Eastern Mass. 2-Meter Net meets on 145.5 Mc. at 1945 Mon. through Fri. UIR has been working on this. The Chelmsford Club is working on a project of walkie-talkies for c.d. and other uses. NTK is manager of the N.E. Emergency Net on 3870 kc. at 9 A.M. on Sundays. NTK's twin brother, K1AWW/4, is moving to Mississippi with the A.F. BGW was in the RTTY SS Contest. AHE and OOP are on 432 Mc. FZJ has some gear on this band, too. Ex-AJU has a new call, WA6CQF. As most of you know by now the license plate bill was killed, so it looks as though good old Massachusetts will be the 49th State to get them. Traffic: (Oct.) W1EMG 549, AWA 541, UKO 322, EAE 146, HGN 112, K1DIO 100, W1MIX 85, K1BYL 73, DGI 72, W1UIR 47, KYC 29, TY 22, BB 18, LMZ 18, K1DJG 17, W1AUQ 16, K1CMS 12, W1DIY 10, UE 8, WU 8, ATX 7, K1IKX 6, W1AHP 4, K1DEY 4, W1DTB 4, K1GRP 4, ACL 2, W1FGT 2, TZ 2, (Sept.) K1BUF 100, W1UIR 24, AOG 14, TZ 9, K1DEY 7, W1FJJ 7, K1DJG 3, W1KXT 2. (Aug.) W1UIR 14. (July) W1UIR 20.

WESTERN MASSACHUSETTS—SCM, Osborne B. McKeraghan, W1HRV—RM: BVR, PAM: MNG. The West Mass. C.W. Net which meets on 3560 kc. Mon. through Fri. at 1900 EST, needs c.w. operators from Springfield and Worcester to check into the net regularly. RM BVR reports that very few operators from those two cities are heard on the net. Otherwise the WMN is doing a fine job. The Mass. Phone Net, on 3870 kc. daily at 1800 EST, is doing very well with good representation from the section. K1CAU has been appointed an OPS. Phone Net certificates have been awarded to AGM, KGJ, DZV, DGL, LDE, FZY and CAU. More certificates are due to go out soon. At the latest meeting of the Hampden County Assn. an excellent turnout heard a very fine talk on receivers by Byron Goodman, DX. UEQ has made BPL for the 12th month in a row. That is a fine record, Red, and a hard one to beat. EKO reports 120 confirmed out of 149 countries worked. DGT reports 112 confirmed. DZV has his traffic total up into the two hundreds this month and KGJ is close behind. KGJ has received a Code Proficiency certificate for 30 w.p.m. At least Fitchburg has some good c.w. men. How about some of you Worcester and Springfield brasspounders giving these fellows a go on the c.w. net? In this, my final report after four years as SCM, I want to thank all of you for your splendid cooperation and hope we can keep in touch on the air. Traffic: W1UEQ 970, DZV 207, KGJ 107, BVR 89, ZPB 68, CAU 58, TAY 25, AGM 15, DAJ 7, HRV 6.

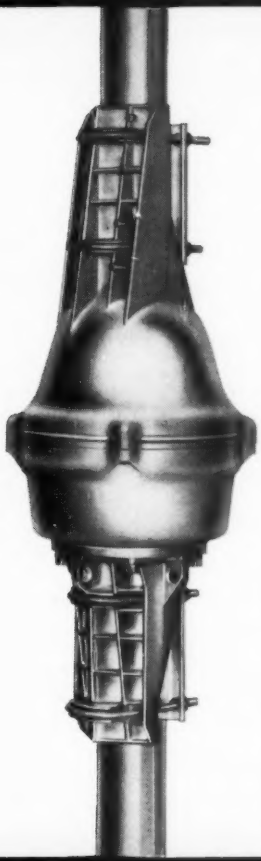
NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—SEC: BXU. RMs: COC and K1BCS. PAM: CDX, V.H.F. PAM: TA. CDX announces that GSPN will sponsor a certificate award to any amateur working 40 net members on 75 or 80 meters, or 10 members on the higher frequency bands. With deepest regret I report the passing of GMH, of Manchester. Cal will be sorely missed by all who knew him. BYS reports an excellent vacation trip to W6-Land, making contacts from Utah and Nevada en route. AOQ reports 214 WNH certificates issued to date. Good luck to HUR in his new job in Burlington, Vt. QGU now is operating from his winter QTH as K2BH. K1BCS was guest speaker on ham radio at a recent meeting of the Bristol Rotary Club. EVN reports 589 from Europe on 20 meters using an aluminum drain-pipe all-band vertical. Cost of antenna: $7.50. MTX has made WAC. New gear: AIJ with a 32V-2, TTU with a tri-band Telrex beam and 54-ft. tower. Certificates endorsed: CDX as ORS and PAM, ASZ (CCE, chief op.) as ORS. Appointments: K1CIF as OO Class III/IV, AIJ as ORS and OPS, K1BOO as OPS. Season's best to all. Traffic: (Oct.) K1BCS 709, CIF 656, W1HKA 264, QGU 195, MTX 62, CDX 28, YHI 18, IIQ 16, AIJ 9, MEL 7, K1BHD 5, W1EVN 3, BYS 2, MKA 2. (Sept.) W1CDX 24, BYS 4.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAMs: KCS and YRC. RMs: BBN and BTV. SXX is the first R.I. recipient of the Worked all Conn. Award which is sponsored by the Willimantic, Conn., Junior Chamber of Commerce. Barrington RO and EC, TGD, reports that six new Gonsets have been purchased for c.d. in his area. WKY is active on 6 meters. The EPARA held its first annual dinner at the

(*Continued on page 132*)

"HAM-M" BY CDR

America's most popular ham antenna rotor



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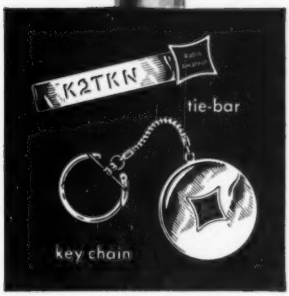

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ON DC TRANSISTOR TRANSFORMERS

Type	D.C. Volts Output	D.C. MA.	Max. Watts	New Ham Price
TY-68S	250	65	16	$ 6.40
TY-69S	300	100	30	8.40
TY-70S	325	150	50	8.96
TY-71S	375	200	75	10.40
TY-74S	600	200	120	12.00

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A SUBSIDIARY OF LITTON INDUSTRIES

Palms Restaurant on Oct. 25. R.I. SEC. PAZ, reports that the Simulated Emergency Test held in R.I. on Oct. 22 was a success. The BVARC held a supper on Nov. 8. The film "Dew Line" was shown at the Nov. 13 meeting of the Roger Williams V.H.F. Society. JWZ has built a transistor 10-meter receiver for his bike and has a transmitter under construction. KGR has built a p.p. 811 final. The new president of the RIYLs is OTI. It has been a pleasure serving as your SCM for the past two years. Your continued support and interest in this column and your appointments during my next term will be most appreciated. Remember that you do not have to be an ARRL appointee to send news to me. Traffic: W1TXL 127, YAP 90, YRC 89, TGD 49, SMU 36, LSP 30, VBR 28, BBN 16, WED 7, DDD 6.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—SEC: EIB, RM: K1BGC. PAM: ZYZ. V.H.F. PAMs: FMK and TBG. K1DQB is a new OBS on 144 Mc. in the Burlington Area. K1BOL is a new OO. DAQ sent in his EC certificate for endorsement. FPS is reporting into USR1, the Regional One C.D. Net on 3500.5 kc., on Thurs. along with OAK. If interested in joining MARS, please contact BXT. K1BGC and ELJ are operating on 50 Mc., while PWB is on this band mobile with low power. QT/1, Cape Cod, operated on 144 Mc., from Vermont. SVL visited KRV. EXZ contacted thirteen countries during the 10-meter mobile DXpedition. UNF put on a demonstration of ham radio at Lyndon Teachers College. A fine F.M.T. report was submitted by MH. K1HKI received his Conditional Class license. RNA has moved to Swanton, and CBW to Waterford. K1DQB is on 75-meter phone. New in the Middlebury Area is KN1HPZ, Sally Walker. EIC, HFS and TFB have been rebuilding the Middlebury College radio station. Visitors at OAK and MMN were QJX, PFU, K2s DLL, HNQ and SJH. Traffic: W1OAK 287, ZEW 121, KJG 101, K1BGC 86. W1KRV 52, ELJ 19, K1BOL 7, W1TXY 7, UWS 4, ZWN 2.

NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—New appointees are CRE as ORS and OO c.w. ASQ is in the local hospital with a mashed foot. BBL has a new harmonic, a girl. W7ZVL was a recent visitor to Alaska. BTP is doing his duty with the Grand Jury. AUV and BLL got in on the 50-Mc. openings, working JA, DU and VE so far. It looks promising for another good 50-Mc. season. BHE and PIV have moved to the Continental States and are awaiting another foreign assignment. AH again is hoping to make a few 50-Mc. contacts. CRE is holding a daily sked with W8QOT and W8QQO. A heavy duty routine is keeping W4RCM/KL7 from his first love of handling traffic. KH6OES, formerly KL7BGA, can be heard every Thurs. on 14.260-Mc. s.s.b. working his many KL7 friends. AN is enjoying visiting all the out-of-the-way places throughout Alaska and meeting many hams. Traffic: KL7BJD 368, CRE 5, W4RCM/KL7 4.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—Congratulations. Membership in Idaho increased from 147 to 207 during the last year. Keep up the good work. The Boise Club is trying to work up c.d. interest and is getting surplus items for it. CPY spoke to the Pocatello Club about the ARRL work. The Simulated Emergency Tests were successful where conducted, from the few reports received. VQC is kept busy with the university traffic. Helen, GGV, introduced ham radio to the Cub Scouts. K7ATO, of Wendell, took his speech class on a field trip to his ham shack for practice. St. Anthony and Rexburg are getting new school stations. BDL spoke to the Lions Club at Pocatello and showed an ARRL movie. How about some news from the rest of the State? Traffic: W7EEQ 22.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—SEC: KUH. PAM: EOI. RM: KGJ. The Montana Phone Net meets Mon.-Wed.-Fri. at 1730 MST on 3910 KC. LOD's new address is 401 S. Bozeman, Bozeman. VDZ has a new baby girl. K7BGZ returned to Terry from Germany. BUJ moved from Great Falls to St. Paul. IAC entered the Service. K#PXD moved from Billings to Houston, Tex. K7CCZ moved from St. Regis to Absarokee. New calls: KN7s EGD, EGE, EGG and EGO in Butte; K7GEF in Lewistown; KN7GGE in Livingston; KN7GHC in Belt; and KN7GHK in Billings. K7DGR dropped the "N" from his call. SFK has been appointed Deputy Civil Defense Director for RACES Communications, succeeding GFT who moved to Baltimore. PMN spent two weeks at the Telephone Co. School in Denver. New officers of Yellowstone Radio Club are EPZ, pres.; ZCO, vice-pres.; K7DGR, secy.-treas.; and VDZ and K7AEZ, directors. Recent appointment: K7BVO as OBS. Traffic: K7EWZ 122, W7SFK 107, K7BYC 38, W7INM 29, NPV 27, K7BVO 23, W7DWJ 16, DEO 15, K7AEZ 9, W7CQC 7, K7DVZ 6, EGA 5, W7TPE

(*Continued on page 134*)

R. L. DRAKE

SIDEBAND RECEIVER

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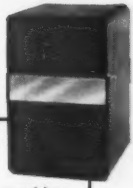

Model 1-A—Complete with self-contained speaker . . . **$299 Amateur Net**

Accessory Speaker
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5"x7" oval speaker, in matching cabinet, for better sideband audio.

The R. L. Drake Model 1-A is an amateur band receiver designed expressly for single sideband reception. No compromise has been made in its excellent sideband performance to enable it to perform on other types of transmission. The important features of the 1-A which make it superior for SSB are: frequency stability, outstanding selectivity and sensitivity, proper AVC action, continuous sideband tuning, correct passband and audio response characteristics, distortion-free product detection, convenient tuning rate, and instantaneous muting and recovery. These points plus the functional design make this receiver unique in its field.

The receiver also performs very well on CW due to the similarity between the requirements for CW and SSB. Almost every feature built into the 1-A for SSB is also desirable for CW.

The Drake 1-A treats AM signals like SSB. The highly selective filter removes one sideband including carrier, then detects the signal as SSB.

The appearance of the 1-A is modern, functional and the uniquely shaped cabinet is designed to occupy a minimum of desk space. The receiver is made self-sufficient by including an internal speaker.

Features for best SSB and CW

OPERATING RANGE: Seven 600 kc tuning ranges cover five "ham" bands: 80M (3.5-4.1 mc), 40M (7.0-7.6 mc), 20M (14.0-14.6 mc), 15M (21.0-21.6 mc), 10M (28.0-28.6 mc), 10M (28.5-29.1 mc), 10M (29.1-29.7 mc)—also WWV-10 mc.

DETECTION: Product Detector for SSB, CW, and AM by exalted carrier method.

MAIN DIAL: Dial is marked in 10 kc divisions; frequency can be estimated to 1 or 2 kc. Pointer is movable to make accurate calibrations. Effective scale length is 8.3 inches.

MAIN TUNING: Concentric tuning knobs provide two tuning rates: 4½ turns for 600 kc and 30 turns for 600 kc. Tuning rate is the same for all bands.

STABILITY: High stability VFO unit operates without switching or ganging through same frequency range for all bands. Warm up drift is less than 300 cps after 15 minutes operation. Crystal-controlled, high frequency conversion establishes this same stability for all bands.

SENSITIVITY: Less than 1 uv for 20 db s/n.

ANTENNA ATTENUATOR: 30 db. Switch provided to switch pad in or out.

SELECTIVITY: Multi-section sideband filter provides selectivity as follows: 2.5 kc at 6 db - 8.1 kc at 60 db. Sideband tuning control moves filter response up to 3 kc above or below the fixed carrier.

S METER: Meter calibrated in "S" units to S9 and 20, 40, 60 db over S9. S9 represents approximately 100 uv at the antenna input, "S" units are at approximately 6 db intervals. Properly damped meter movement for steady readings.

AVC: Amplified-delayed AVC. Integrating dual-action time constant circuit gives fast charge, slow discharge for modulation, but fast charge, fast discharge on short pulses. This provides some noise limiter action.

AF RESPONSE: Down approximately 20 db at 65 and 6200 cps; down approximately 6 db at 200 and 3500 cps.

AF OUTPUT: To internal speaker or 4 ohms to external speaker, headphones, and transmitter anti-trip.

RF INPUT IMPEDANCE: To match 50-75 ohm coax line.

CRYSTAL CALIBRATOR: Provides markers at 100 kc intervals across all bands. Off-on switch is part of ANTENNA TRIMMER control.

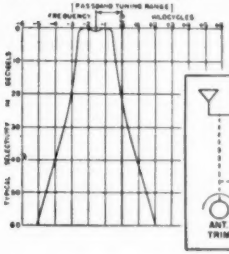
POWER CONSUMPTION: 50 watts at 115v - 60 cps.

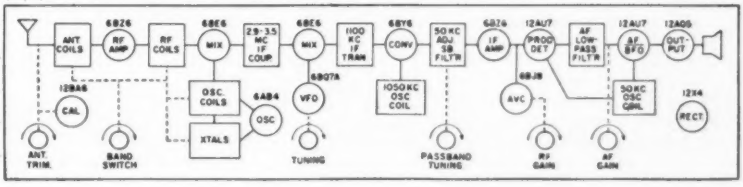
DIMENSIONS: 6¼" wide x 11" high x 15" deep.

WEIGHT: 18 pounds.

FRONT PANEL CONTROLS: Band switch - Main Tuning - Sideband Tuning - Antenna Trimmer/100 kc calibrator - RF Gain/Standby Switch - AF Gain/Power Switch.

BACK PANEL CONTROLS AND TERMINALS: S-meter zero adjust - Antenna Attenuator Switch - SO 239 Antenna connector - Muting connector - External speaker/phone jack - 4 ohm AF Output/Internal speaker input.





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OREGON—SCM, H. R. McNally, W7JDX—SEC: QYS. RM: AJN. PAMs: NJS, low frequencies; VHF, Southern Oregon; RGS, Northern Oregon. The Columbia River V.H.F. Net and the Portland C.D. Net, both on 50.55 Mc., are progressing nicely. OSN had another good month in October with big things planned for the future. BRATS in October were AJN, OMO, ZB and ZFH. A fine RACES meeting was held Oct. 12 at Portland's new c.d. headquarters. The OARS is rebuilding after losing its club house and is seeking members. New ECs are SNA for Wasco County, VIL for Jackson County and RXJ for Lincoln County. BLZ is Asst. EC for Lane County and GLZ is the new Asst. EC for v.h.f. work in the Portland Area. NGW resigned as V.H.F. PAM and RGS has been appointed to the job. ZQB is fire chief at Mt. Vernon. ZB and BDU are new ORSs and both are making a good showing. K7AUV is a new OES and already is doing checks. Some nice reports were received from Beth, NJS, who is trying to stir up some reporting activity among the OPSs. She also has plenty to do as YLRL president. JCJ says the OARS Net is being revamped and should get going again soon. PJK won a W-Conn. Award from the Willamante Connecticut Junior Chamber of Commerce. Fine work, Bob. ALG still is busy on 20 meters. Nice reports came from UIU, DIC, BLN, UQI and others. Traffic: W7ZB 558, LT 41, ZFH 39, BLN, 37, DIC 37, AJN 34, OMO 32, BDU 21, BVH 17, UQI 17, UIU 14, K7CNZ 12, W7DEM 7.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—SEC: PQT. RM: AIB. PAMs: BBT and PGY. Washington nets: WSN, 3575 kc, 1900 Mon. through Fri.; WARTS, 3970 kc, 1800 PST Mon. through Sat.; NSN, 3700 kc, 2100 PST Mon. through Sat. The QCWA meets Sun. only on 3655, 3950, 7125 and 7210 kc. The board of directors for the QCWA is planning a Northwest Chapter Second QSO Party for Mar. '59. The chapter now has 190 members from Washington, Oregon, Idaho, British Columbia and Alaska. HRC is sporting a new SX-101. RGL has a new sky hook in use now. The Annual Simulated Emergency Test of Oct. 11 netted 33 check-ins from the Spokane Area. GVV again is on the air after a long lay-off. EVW is recuperating after an eye operation. The Radio Club of Tacoma, Inc., now is located in new quarters and is busy remodeling for the club station. The call DK will be used. BSW has a new Valiant and is looking to s.s.b. ZFY is attending the Coast Guard School of Electronics at Groton, Conn. KN7DWT worked all states and needs Asia for WAC in just 103 days. JHV has a new Triband. IKG has a new HQ-170. K7EVT and his XYL K7EVQ now are at Fort Lewis, Wash. LVB reports his beer-can vertical really is hot on 15 meters. K7ASY has been appointed EC for the Tacoma Area. New Novice calls in the Prosser Area are KN7s GGA, GGG and GJA. GHM is QRL school. New officers of the Spokane Radio Amateurs, Inc., are EQU, pres.; OWJ, vice-pres.; ZNN, secy.; UOJ, treas.; HCJ, JYO, OPR and K7AFE, trustees. The Spokane AREC had 18 mobiles cooperating with the police department during Halloween. ULL worked WAR on 29.6 Mc. using a walkie-talkie with a power input of .2 watts from downtown Spokane. USL has been appointed new RACES Radio Officer with HCJ, HZV and ULL as assistants. XD joined the ranks of Silent Keys. Eighty-five members and friends of the Skagit Club enjoyed a salmon Bar-B-Q at CZY's. AIB spent his vacation in the Reno, Las Vegas and Los Angeles Areas. JC is chasing DX. QLH makes BPL. The Puget Sound RTTY Net meets on Tue. evenings at 2100 PST on 147.0 Mc. CBE is net control station. LVB and QLH have been nominated as net managers of WSN. The Aberdeen Radio Club is holding a drive for membership in ARRL. AMC is building hi-fi for the XYL. IEU received his MARS appointment. Traffic: (Oct.) W7BA 1737, PGY 1102, QLH 541, KZ 308, DZX 306, APS 153, AMC 92, BBT 58, USO 50, HUT 47, IEU 40, UWT 36, LVB 32, AIB 17, LFA 14, WQD 13, CZY 6, OPW 6, JC 4, TWC 4, YFO 4, EVW 3. (Sept.) W7BXH 4, EKQ 4.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—Nevada certificates were issued as follows: No. 62-K6RGO No. 63-WVQ, No. 64-K7ANK, No. 1 endorsement for 100-VIU. UPS and KOI are working lots of DX. UPS is making phone contacts with KA6IJ on Iwo Jima for the family of a local man there. He is a new OPS. VIU made DXCC and still is handling traffic on RN6. PAN and TCC. CNG has gone s.s.b. PC is arousing 2-meter interest around Reno. New members of the 2-meter net are CX, PC, SDE, ZCA, CZZ, FEP, PBG, VJR, K7BJB and BIZ. The NARA held an outing at Lake Lahontan in September. MAH was promoted to a lieutenant in the Air National Guard. CX gave an s.s.b. talk at the NARA meeting. K7AHA received a nice

(*Continued on page 136*)

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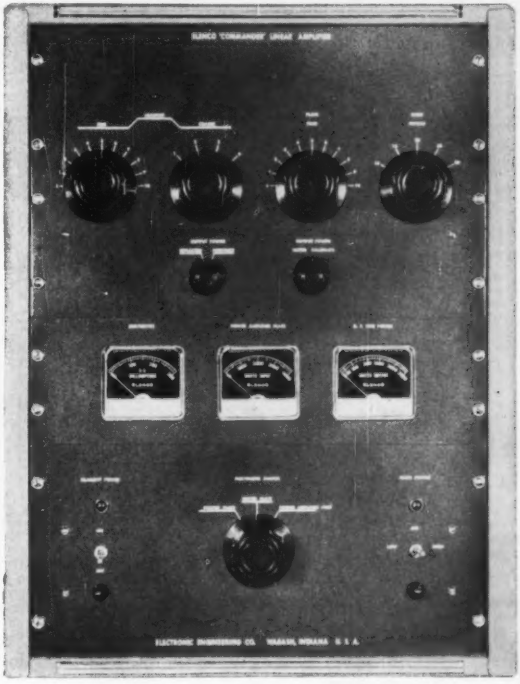

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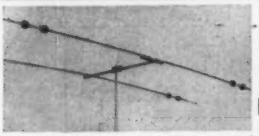

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SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—W6YHM found time between cross-country trips to deliver all the records of the SCM to K6DYX, who took over the office on Oct. 15. W6PLG assumed new duties as PAN manager on Nov. 1. K6EWY has a new Boehm keyer and is looking for some high-speed traffic skeds. He sold his Kleinschmidt to W6HC. W6QMO recently returned from a family visit to Arizona where she had eyeball QSOs with W7KOY and MME. W6OH reports a few points made on 75 meters for the Oct. Phone CD Party. K6OSX, with a new OPS appointment, promises to give OH some competition on the next one. W6DEF is open for some daytime traffic skeds since he's working the swing shift. K6BBD is making plans for operation from XEØ-Land come March. W6SHK, W6CZI and W6AZN are now active on 432 Mc. with APS-13s. The Monterey Bay RC had its annual gift exchange party at the c.d. headquarters in Salinas Dec. 16. The Fort Ord RC has expanded into additional quarters next door to the MARS station with a lot more space for shop work and club activities. K6HMD got a new 10/20 beam up before leaving for Korea. W6CST replaces Juan as vice-president of the club. Meeting nights are the first Wed. of every month with code and theory classes each Mon. and Fri. night. Visiting hams are made welcome at any time. Traffic: K6DYX 845, W6QMO 314, W6BPT 192, K6EWY 185, W6DEF 62, K6HGV/6 49, W6YHM 47, W6HC 45, W6ZLO 38, W6OH 26.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary E. Lorenz. W6PIR, SEC: W6CAN. ECs: W6LGW, W6ZZF, W6IUZ, K6EDN, K6JNW and K6QZG. K6DMW has a new Drake receiver. K6AIU is a new XYL reporting to the SCM this month and works 7 Mc. Let's hear from more of you YLs and XYLs with tickets. W6ASJ is net control for A6ASJ/A phone and A6ASJ/B RTTY Net. K6IBQ has a new 813 rig on 75 meters. K6QHC scored 150,000 points in the C.W. C.D. Party with 70 sections. K6GK is getting RTTY equipment. W6AKB boosted his DX tally with two new ones. K6PLY bought an HRO-50 and has a DX-35 with a three-element beam on 21 Mc. and also is building a kw. amplifier with 4-250A and 304TL modulators. K6OKK worked W6GCG/7 in Nevada on 50 Mc. with ground wave, and is building 432-mc. gear. I regret to announce that W6RBQ a former Pacific Division Director, has become a Silent Key. K6VXK is now General Class and is on 3.9 and 7-Mc. phone. K6SQT is a new station in Napa on 50 Mc. KN6SRU is Contra Costa County Sheriff and is on 21 Mc. W6QEP is in Kaiser Hospital with two broken legs suffered in a fall off the roof of his summer cabin. K6KRF is the proud papa of a 6-lb. 11-oz. YL. W6AIL is QRL a new addition to his house. K6IRB is on 144 Mc. W6HOF has a new beam. K6TPO is building a 50-Mc. rig. W6EPI is modifying his "Isetta" mobile rig for push to talk. KG6AHU and family were house guests of K6YXT. K6AQ is eavesdropping on 144 Mc. with a modified BC-1068. The MDARC supplied communications for the Walnut Festival. The Hayward Auxiliary Police, under EC K6JNW, had two S.E.T. operations in October. WA6BRD has been appointed liaison station for RN6 and PAN. W6TT's DX score now is 275 worked. The NCDXC had an FB picnic at the home of W6ITH. W6ITH is building a home in FS7-Land. W6LDD has a 265/258 DX score. K6SSJ is the new editor of the NCDXC bulletin. W1LVQ gave a nice talk to the Sacramento Radio Club on the coming Frequency Allocation Conference to be held in 1959. The East Bay section made an FB showing in the S.E.T. That's it for this month. Keep those reports coming in on the last day of each month. Traffic: (Oct.) K6GK 344, K6OSO 128, K6DMW 93, K6QHC 59, W6JOH 56, K6ZBL 39, W6ASJ 22, K6OKK 2 (Sept.) K6OKK 6.

SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—An FB report was received from EC W6SLX, up Eureka way. Ed tells me the Humboldt gang is planning new activities so that in the new year you can look forward to reading and hearing much more of the Humboldt RC. W6FBK has a new daughter born recently. WA6BHV is a new call in Eureka. He had the call KN6OBX before he went into the Navy. Old-timers, please take note: K6RPC, K6TWK and K6GRX, 14, 13 and 16 years of age, respectively, were active participants in the S.E.T. Item of interest: K6ANP, San Francisco EC, during his S.E.T. traffic-handling, was surprised to work an amateur in Italy. Guess Italy hams are interested in our S.E.T. activities, also. The congenial gentleman of 75-meter mobile phone, K6BAQ, informs us that his station also actively participated in the S.E.T. Our new OBS, K6OPI, is getting his bulletins out on c.w. on sked. Bill is really going places; his fist is as clean as a well-cut tape. The Cathay RC should be well on its

(*Continued on page 138*)

INSPIRATION IN RADIO ELECTRONICS

Think big has always been the order of the day in radio electronics. Galvani, Marconi and you either have changed or can change the world with a thought or an idea unheard of before. Seeing all that's new at the 1959 IRE SHOW can spark your new idea—can be your inspiration. Big in number of manufacturers and suppliers exhibiting, big in number of top radio electronics experts, big in number of important developments on display—that summarizes this year's CONVENTION and SHOW. Don't miss this once-a-year opportunity for man-to-man talk with the thinkers, planners and doers in your field of specialty.

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way toward starting the new year off with its club station in tip-top shape. K6LRN is busy building two finals—single-ended 813s, no less. FB, Dick! As this report will go to print in the January issue of *QST* I would like to take this opportunity to wish you all a most Prosperous New Year. I am planning my semi-annual radio club visitations and am looking forward to meeting each of you personally at your club. If any of you, individually or collectively, have any problem which you think I could help you solve please feel free to drop me a note. If in your club you have members who would enjoy a League appointment, send his or her name to me. We are doing all possible to speed up your mail service on League publications in this section. K6PQH, mgr. NCN, is doing an FB job in his net. Lee tells me that check-ins from the San Francisco section, particularly in the northern and central areas, are in demand. W6FEA is about as busy as Santa was at Christmas in her new appointment as SEC. Her OM, W6WJF, is equally as busy supporting his *MYL* (married young lady) as RM. Many thanks to all of you who are sending in postal cards telling us of your activities. Please keep the reports coming and thanks, Fred. Traffic: W6GCV 24, W6OPL 12, W6BIP 11, W6GGC 8, WA6ASW 7, K6OPI 6, K6EKC 5, K6BAQ 3, K6LCF 3, W6GQA 1.

SACRAMENTO VALLEY—SCM, LeVaughn Shipley, K6CFF—The roofs are on many new ham shacks, including those of W6ESZ, K6JNV, W6TOL, W6WWW and W6GBE. It is real nice having W6GQS back with us. Clair was laid up for some time having been the victim of an auto accident. WA6CXF is the newly-assigned call of the Sacramento Junior College Amateur Radio Club. Daily code and theory classes are being conducted at the college. New Official Bulletin Stations include W6AF, W6GDO, K6YOU and W6GGW. K6IXU is a new Official Phone Station and W6WLI is our newest Official Observer. Once again we must take our hats off to W6QMO, of South San Francisco. It seems that during her tenure as NCS of the Northern California Net Jeri learned that one of her most faithful traffic-handlers was K6YBV, who has made BPL so many times your SCM is hardly sure of the count. When Jeri learned that Bob copied his messages on a Braille tablet she started a drive to raise some money. The results at this writing—a Braille typewriter—has been ordered for Bob, complete with carrying case, table and a generous supply of paper. Our heartfelt thanks to Jeri and the other amateurs who donated so generously. Just saw the first issue of *YL Harmonics* (YLRL) edited by K6ENK. If this is a sample of what the girls have to look forward to then Wanda is destined for national recognition. Traffic: K6YBV 738, K6SNA 56.

SAN JOAQUIN VALLEY—SCM, Ralph Sarovan, W6JPU—W6EBL has a new HT-32. K6SVG made WAS on 6 meters. W6YGQ has a Heath V.F.O. K6TOD, K6QGE and K6IOW are attending COP in Stockton. K6IXA won the 20-meter hunt in Turlock. WV6CRZ is a new ham in Delhi. WV6APA is in Merced. The Merced Club acquired five c.d. 2-meter Gonsets. W6UZG is the secretary of the Kern Radio Club. W6GQZ is selling out and plans to move to another QTH. K6BP is experimenting on new antennas. K6SWT mobiled to W4-Land and back. K6AYL has a new QTH and ham shack. K6ZPZ is on 75-meter phone. K6GQK is on 6 meters. W6OXB is teaching student pilots. W6RLG has an 813 in the final. W6YEX is mobile with his pick-up truck. K6BFX has a Valiant. K6OES has an Apache. K6TNZ has a kw. with a 20A. K6VAZ worked over a DX-35. K6LKJ spent 6 days aboard the Aircraft Carrier *Kearsarge* as a civilian observer. W6BST is going TV soon. W6NKZ is experimenting with transistorized power supplies. K6ZCD is building up a high-power power supply. K6KLG/6 is in Stockton with an HT-32 on 75 meters. W6NCG is back from the Navy and is busy building some gear. K6BKZ is on 75-meter s.s.b. I'd like to take this opportunity to wish all of you a very Happy New Year and thank you for the fine cooperation of last year. Traffic: (Oct.) W6ADB 102, W6USV 22, W6ARE 5, K6SNA 1. (Sept.) W6USV 7.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL. PAM: DRC. V.H.F. PAM: ACY. The AREC report for October indicates that work is going forward in good fashion with 284 members of which 232 are full members and 52 supporting members. There are 21 local emergency nets that held 33 training sessions. Eleven nets are on 75 meters, one on 40 meters, five on 10 meters, one on 6 meters and three on 2 meters. Eleven of the twenty-one have liaison with other nets. ACA, of Brevard, sent along an interesting report on Air Force MARS, which had 30-40 outlets in the State set up for operation during "Helene." RJ sent in a report on the S.S.B. Net. AJT sent in an interesting report on its

(*Continued on page 140*)

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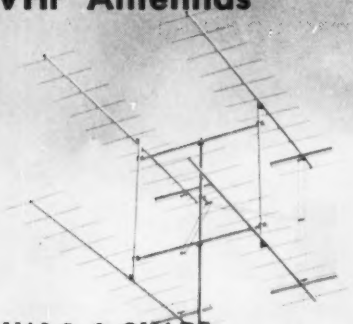

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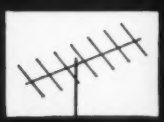

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c.d. mobile unit. HRS supplied me with an excellent report on the Six-Meter Net. K4RVD was appointed EC in District No. 3A. BBZ has been appointed ORS. We are sorry to lose TQU as EC in District 8A, but pressing work and time were the reason. Please note again the article in *QST*, page 88, under "Traffic Topics" and do as suggested (Nov. 1958). We still need outlets in many towns. BAW appeals for operators on the NCN (C.W. Net). The RACES Net, for drill purposes only, has been moved to 3865 kc. A procedure class for RACES personnel is being taught each Fri. at 7 P. M. Traffic: W4DSO 217, RRH 35, BBZ 10.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—In Rock Hill on Oct. 11 a panel discussion was held by managers of c.w., s.s.b. and phone nets to better coordinate for emergencies. AKC, YOS, K4EGI and K4PJE discussed operation of their nets with GQV as moderator. NTO reported on 6-meter activity in Spartanburg. HJK discussed 2 meters and c.d. MWH was guest speaker for the panel and at the hamfest the following day. K4WCZ expects a big increase in traffic from Fort Jackson. K4AVU is the new president of the Palmetto Radio Club. Winners in the Palmetto RC hunt Oct. 5 were K4AII and K4DWE. A total of 70 members attended the S.S.B. Supper at Summerton on Oct. 7 with Capt. Gill as guest speaker. The "Gimmick" Contest held by the Spartanburg RC on Nov. 4 in the new club house was a big success. When final scores are tabulated, South Carolina expects to be high in the nation in the S.E.T. with a total of 881 messages. Clemson RC, under the leadership of K4IPG, has 22 members with YOS as advisor. BPL was made by AKC, DAW, K4PJE, K4GAT and K4WCZ in October. The Mike and Key Club is approved for affiliation. Traffic: K4WCZ 695, W4AKC 629, K4BVX 388, GAT 370, PJE 248, HJK 209, W4PED 202, DAW 190, K4AVU 182, BLF 170, EGI 164, W4GQV 150, CJD 121, K4PIA 77, W4CHD 51, K4HQK 49, W4QCC 46, TWW 41, BHR 26, ZAP 18, K6RUO 6.

VIRGINIA—SCM, John Carl Morgan, W4KX—Top Virginia scores in the free-for-all: K4EZL 215, K4CAX 208, CHK 152, K4DSD 135, K4EIG 133. For complete list of scores reported see *Virginia Ham*. Out-of-state winners and the above will receive nice certificates, printed through the courtesy of K4EZL. Seventy-two "FFA" logs were received, including 22 from Virginia. LW has been forced to resign as VSN mgr. because of Navy business. K4JKK got out his first issue of *Virginia Ham*. If you are not on the mailing list, contact JKK. ZLN reports new 10- and 75-meter training nets in the Fairfax Area. K4MJZ really cooked up fine activity during the S.E.T., and now is working on a local S.E.T. in cooperation with the Arlington Police. CVO reports from VP9-Land. IJZQ, now in Norfolk, is operating K4LPR's rig. KN4AJL, the XYL of K4QIX, is looking for more YL contacts. KNs APV and AUU now are on the air in Powhatan. K4BRQ, therefore, no longer is the sole ham there. He says his hamming is curtailed because his 6-foot-five stature makes him a natural for basketball. BGP is permanently set up in Norfolk after finishing eight years in the Army. CXQ reports a new V.P.I. club (K4KDJ) with K4CLO, CHK, 3APT and CXQ as officers. K4CQA now is /8 from West Virginia, where he teaches math at W.V.U. K4IIP says the Old Dominion ARC (Halifax Co.) is converting surplus gear for the 10-meter RACES Net. OOL readied the SVARC (Winchester Area) rig, RKC, for the SS. SHJ is back at Norfolk-Division, working on a degree which QRMs traffic. QDY was out of town for several weeks and missed on VN, 4RN and UTL. Traffic: (Oct.) K4ELG 695, EZL 694, QIX 533, QES 395, KNP 320, JKK 170, W4RHA 86, SNH 79, SHJ 75, K4AET 64, MJZ 61, EIG 57, W4BGP 56, KX 56, K4KDJ 47, MEV 40, W4JUJ 35, K4QER 26, IIP 21, W4LW 18, IRI 10, OOL 9, ZM 5, K4LPR 4, W4CVO 3, K4ARO 2. (Sept.) W4BGP 27, K4EAS 16.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM: Fes Greathouse, 8PZT. SEC: HZA. PAM: GAD. RMs: GBF, FNI, PBO and VYR. V.H.F. PAM: K8IYU. GAG, GWV, GWR and JZO are new ECs. IRN and DJP are working good DX on s.s.b. NYH renewed ORS and OPS appointments. FNI renewed ORS appointment. The W. Va. V.H.F. Net operates on 50.76 Mc. each Wed. at 2000. K8HEK, MNT and NMU are new hams on 6 meters. K8IXO and CMW put out good signals from a mountaintop near Logan. K8CAY and JHX are planning high-power rigs for 6 meters. JQI has a new beam. CAW, HRO, IYU and JHX attended the Cincinnati Hamfest in September. K4CQA/8 is doing a fine OO job. K8CSG/KLI has a new Triband beam. FUM is doing an excellent job as EC in the Huntington Area. GXR, Asst. NCS for the V.H.F. Weather Net, also is doing a fine job. K8AON is awaiting his General Class ticket. K8JLF has his General Class license. KNC and FNI operated in the last V.H.F. Party. BLR has a new 5-over-5 high-gain beam on 6 meters. K8DBB is operating 10 meters. 8SA's

(*Continued on page 142*)

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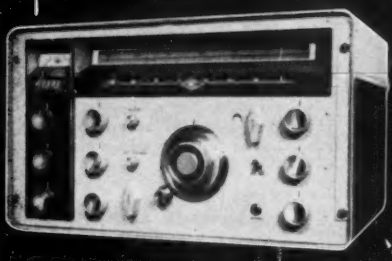

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father passed his Novice Class exam. ESH is very active as an OES. K8CRM participated in the recent CD Party. BRM is a new ORS. New officers of the MARA are GZK, pres.; PZT, vice-pres.; JM, secy.-treas.; DPT, act. mgr. GAD, DZU, JM, HTT, UMR, K8ARA and VOI received WACWV awards. A W. Va. Hamfest will be held July 11 and 12 at Jacksons Mills. K4RAK/8 attends Alderson Bradus College. KN8LQT, new in Rennick, is active on 80 meters. K8DUO has new antennas on 40, 20, 15 and 10 meters. K8EAB has 32 states toward WAS. VII has a new DX-100B. Traffic: (Oct) W8FNI 165, K8HID 121, W8HZA 96, PBO 67, K8HRO 66, W8VYR 60, VWK 51, NWH 21, K8CSG 12, W8PQQ 11, JLK 9, K8CRM 2, BLR 1, IYU 1. (Sept.) W8FNI 40, YNH 26.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonemore, WØDML—SEC: NIT. PAMs: IJR and CXW. OOs: OTR and RRV. OBS: KØBTU. KØCLJ has a 4-65A running 2:0 watts. New check-ins on 6 meters are W3CSJ/Ø, ERR, EVQ, FCN, LVI, WQG, WVA, WOZ, YDM, ZGR/Ø and KØs JUG, MFV, OKP and PTU. YAE frequently is heard in Denver on 6 meters. KØHEM, ex-5ONL, recently moved to Denver. DQN has been appointed Air Force MARS State Coordinator. RRV is working 2 meters with an SCR-522. KØEBV is newly-elected president of the Denver Radio Club. Other officers are SIN, vice-pres.; YHI, secy.; and VDY, treas. PG, RQI, SIN and VDY are new members of the board. The new call for John, the *Round Table* printer, is KNØRRS. SHF and SHH are new residents of Loveland. CBI has been vacationing—and you should hear the elk-hunting story CVG and the Colorado Springs gang put out this year. Did you notice the list of W5s, W6s, W7s, W8s and W9s IC compiled on the 144-Mc. skeds during August? LVS recently returned from an extended inspection tour. KØDXF is on a business trip to Pueblo. KØs AMU and EGG have new QTHs. GRG, NIT and KØIQZ put on a closed-loop television program at the Pueblo College for the Colorado Vocational Assn. Traffic: (Oct.) WØIA 1108, KQD 431, KØDXF 171, EDK 117, EDH 86, EVG 72, WØDQN 65, TVI 57, WME 53, QOT 47, CBI 43, ENA 34, NIT 15, RRV 11, KØCLJ 1. (Sept.) WØRRV 11.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: FSC. PAM: BBN, V.H.F. PAM: SP. UTM had to cancel his appointments because of ill health. K7AUM with a DX-35, a v.f.o., an S-38E and a new antenna coupler has been working DX on 15-meter phone, proving that low power works too. OCX again has received BRAT (Brotherhood Radio Amateur Traffickers) award. John Huntoon, from ARRL Headquarters, spoke to the Ogden Amateur Radio Club on frequency allocation. Activity on the Beehive Net (Sun. 7272 kc.) has increased after a summer slump. OCX has just installed a new Johnson directional coupler and indicator. EII has organized a radio club at Jordan High School where they are conducting code classes. Please send monthly reports to the SCM. Activity and reports is the criterion for ARRL appointment. Traffic: W7JBV 152, OCX 114, GDD 10, ZWJ 7, QWH 5, K7AUM 3.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. The NMEPN meets Sun. on 3838 kc. at 0730, Tue. and Thurs. at 1800 on 3838 kc. The Breakfast Club meets on 3838 kc. Mon. through Sat. at 0700. The C.W. Net meets Mon. through Fri. on 3570 kc. at 1900. The SEC, ECs and Assistant ECs can be justly proud, along with all members, of this year's S.E.T. Thank you all very much. FPB is the owner of a certificate in the Quarter Century Wireless Association, Inc. Father Crispin, K5RXN, has been appointed Assistant Director, Rocky Mountain Division, by Claude Maer, jr. The best of luck. The Caravan Club of Albuquerque elected new officers announced at the club's annual XYL dinner. Pictures and clippings taken during the S.E.T. throughout the State have been forwarded to ARRL and the SCM. ESN is the new EC for Taos. WNU signed up 12 new members for the AREC in October. Traffic: (Oct.) K5WSP 2508, DAB 72, W5VC 47, WNU 46, K5LFE 32, W5RFF 30, K5DAA 20, LWN 20, JJD 10, W5GD 8, K5GYZ 6, HRK 6, IQL 6, W5ZU 6, K5GLJ 5, LFF 5, W5FHL 4, BQC 2, K5IPA 2. (Sept.) K5FHU 782, W5DWB 353.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets Sun. at 0830. The YO Net, on Mon., Wed. and Fri. at 1830 on 3610 kc., is a c.w. net. BHH has been reappointed RM and ORS. Section Net certificates are being mailed to net members for regular attendance by net control stations. The Worland High School has an amateur station sponsored by KN7GDX using DX-100 and SX-101 gear. The Casper Club holds meetings every other Tue. at 1930. K7CSW is doing a nice DX job with a quad antenna. A new net, the

(*Continued on page 144*)

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Wyoming Jackalope Net, started Oct. 7, and meets on 7255 kc. at 1200 MST Mon. through Fri. for emergency and relaying of traffic. YJG, of Cheyenne, was a recent visitor in Casper. MZW is having transmitter trouble. Traffic: W7AXG 48, CQL 28, BHH 10, AMU 5, TZK 5, IDO 4.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: EBD. PAMs: DGH and K4BTO. RM: RLG. The AENB has MKQ and K4s YAF, POZ and UQR as new members. Welcome to new stations in Jasper, K4UGP and KN4BJM. DDH and K4PHH both have new shacks. K4PHH is a new OPS and KJD a new OBS. Thanks for your generous activity. K4HJM has taken a new job. We will miss his good signal from Anniston. TOI is active as an OO with a new operating console. GJW has a new TA-33 beam and 60-ft. tower and confines his operation to OO work and DX. Congratulations to RLG. She did it again—BPL, I mean, with 587 in October. K4DRQ has a pair of 813s linear now. Birmingham continues to show progress with its Emergency Communications Council. The AREC program shows another increase in membership this month. The Montgomery Club has a new constitution and board of trustees. It has published a roster of all operators in the Montgomery Area. Congratulations to K4VCM, newly-elected manager of the Teen-Age Net. Don't forget to send your Form 1 card each month. Traffic: W4RLG 587, K4SSB 96, PHH 39, AOZ 38, JDA 38, W4MI 27, K4BTO 26, DRQ 24, W4DGH 23, EOH 19, CEF 18, PVG 17, CIU 12, TOI 10, K4HJM 3, W4HKK 3, K4KJD 2.

EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAMs: TAS and RMU. Now that the '58 hurricane season is over, let's not be a deserter from our Section Emergency Net. We need lots of practice in handling traffic and this can be secured by checking into one of our traffic nets. K4OYR received his WAS certificate. K4GPI received a CP-30 certificate. Auburndale now has an old-timer, K4CK, back in ham radio after being inactive for 23 years. Officers of the Fort Myers Club are KET, pres.; PJG, vice-pres.; and K4RTY, secy.-treas. New officers of the Jacksonville NAS Radio Club are HMO, pres.; K1AHT, vice-pres.; JMU, secy.-treas.; WHK, act. mgr. K4JEE has a new Rohn tower. TFT has a new Heath Apache and is sweating out a Mohawk now. K4IWT handled a total of 276 messages during the S.E.T. K4TZC has a new Globe King. New officers of the Lake Wales ARC are COZ, pres.; YZP, vice-pres.; and LJM, secy.-treas. The Lake Wales Club is conducting classes on general theory with DPD and LJM as instructors. The Gold Coast Six group took part in the S.E.T. and set up a portable station at Greyhold's Park operating on emergency power. RMU caught the Oct. 9 opening and worked several stations on 2 meters in the 1, 2, 3 and 4 call areas. Allen is our V.H.F. PAM and he is looking for any suggestions on how to set up a state and/or section-wide v.h.f. net. If you have any good suggestions, please drop him a line. Fellows, the radiogram traffic reports are fine for those who failed to mail their Form 1 reports before deadline but we need the news also. Please. Traffic: (Oct.) K4SJH 1019, GPI 283, KDN 221, W4YOX 219, IYT 202, K4IWT 178, RZQ 173, LCF 150, COO 140, AHW 135, BR 92, ODS 70, AEE 68, W4TAS 68, K4AKQ 67, BNE 60, RNS 51, ILB 46, W4SJZ 40, BWR 29, K4YOQ 23, W4JO 21, MBO 17, K4ANJ 13, W4AZK 7, K4MTP 5, W4WUU 1. (Sept.) K4TFS 93, OYR 3.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW. RMs: AXP and BVE. Port St. Joe: K4RZM. EC, conducted a very FB S.E.T., with MXN, K4LQQ, ALN, SGG, K4RZF and KN4UPI taking part. LQQ and MXN are mobile on 75 meters, both using DX-100s at home. ALN works c.w. with a 90-watt homemade rig. SGG is active on s.s.b. UPI has a new Globe Scout. Tallahassee: K4PVU is active on 15 and 80 meters when school permits. K4VLE is a new ham on 10 meters. De Funiak Springs: K4DSH is back on after a long illness. Ft. Walton: A new 10-meter antenna for the e.d. station has been installed on the city water tank—150 feet high! The Eglin Radio Club has ordered a new Heathkit receiver. RKH has joined the v.h.f. ranks with a 2-meter Communicator and ground plane. The Northwest Fla. Net (NWFN) and Eglin/Ft. Walton 10-Meter Net (HAIR) have been registered with ARRL. BVE reports a new record in traffic handled by NWFN this month. Panama City: K4OID reports the PCARC set up a booth at the County Fair for traffic and demonstrations using the call K4GVV. Pensacola: The PARC, e.d. and v.h.f. club, had a ham exhibit at its County Fair. Over 200 messages were originated from K4ALI and relayed on 6 meters to SRK. Others helping were KBQ, UKG, LQC, EQR, OOW, CLK, ECP, RMO, HIZ, IVD, PLI and SGR. The V.H.F. Club has a new meeting room in the Army Reserve Bldg. at the Airport. SRK

(Continued on page 146)

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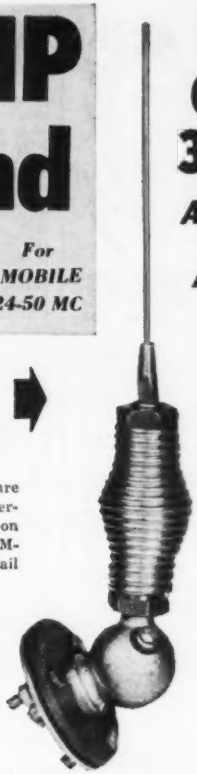

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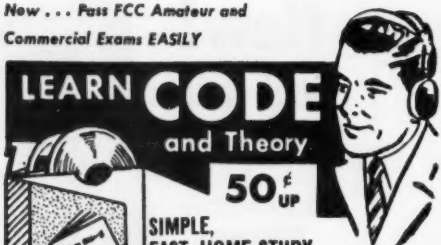

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is a new ORS. HBK has cards for DXCC and is active in the CD and SS Contests. Traffic: (Oct.) K4OID 124, W4BVE 121, K4PVU 55, RZM 37, DSH 4. (Sept.) K4DSH 34.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. 0800 Sun.; ATLCW on 7150 kc. at 2100 EST Sun.; GSN, Mon. through Sat. at 1900 EST on 3595 kc. with PIM as NC; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc. with MV as NC; the ATL Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc. with VHW as NC; the GTAN Sat. at 1000 EST on 7290 kc.; the GPYL Thurs. on 7260 kc. at 0900 EST with K4CYV as NC; the Ga. Novice Net Thurs., Tue. and Sat. at 1800 EST on 7157 kc. with K4HMS as NC; the GAN on 7105 kc. at 1800 EST Mon., Thurs. and Fri. with K4KZP as net mgr. K4LEM made his first BPL; he also had a little tough luck with his DX-35. The Columbus High School Amateur Radio Club has been formed with K4-BAI, pres.; K4TDY, vice-pres.; KN4BVD, secy.; K4-UAF, act. mgr. K4KZP made BPL again, which entitles him to a medallion. He was top scorer from Georgia in the Va. Free-For-All QSO Party. ETD is now director of 14th AF-MARS. Had the pleasure of visiting with the Columbus Radio Club Nov. 14. A wonderful crowd of about 40 attended, including 5 ECS. Among the visitors were UCC from Forrest Park and KR from La-Grange. K4CZQ still is in school. K4OQY says school is getting easier. K4HOU put up a new all-band dipole. Cartersville has three new hams—KN4BYA, KN4BYK and KN4BYO. PDP still is chasing DX. Explorer Post 599 has been chartered by the National Council Boy Scouts of America. This is a specialized radio post, the first of its type in the country. All members will be hams. Charter members are K4OLN, KN4YIG, KN4-TBR, KN4VOX and KN4YAQ. Happy New Year to All. Traffic: K4LEM 229, KZP 207, BAI 155, LVE 54, W4-BXV 35, K4CZQ 12, W4DDY 11, K4OQY 10, HBI 7, W4MA 1.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. YD fell 20 feet off his roof and broke his arm. KD put up a Mosley Tribander Jr. He received WACAN (Worked all Canada) certificate No. 30, now has DXCC-230 and qualified for a CO7 certificate in one hour and eight minutes. ACF and RM have Mosley Tribanders. W4EXO is now KP4APY. CC is on 7-Mc. s.s.b. ALW is transferring to USWB Miami. RD bought a Viking II for local contacts. KP4CGB, the Coast Guard Radio Club, reports to the 3925 kc. Net on Wed. KP4-AOB operates at CGB with a BC-610 and an HRO receiver. VP2DQ, in Dominica, uses a Collins TCS and an SX-25 receiver. URO is going strong on 15-meter c.w. with a DX-20. WP4APR is a new ham in San Juan. DV is trustee of NW, HZ is trustee of ID, stations of the PRARC. KV4BA visited Mayaguez and San Juan. AKC received a WPR25 Award certificate. The PRARC Picnic at Aguas Buenas was attended by 31 licensed members and their families. AKH uses a DX-40 and is very active while recuperating from a peptic ulcer. GN is operating mobile with Gonset Twins and works into the States on 40-meter phone every day. QR is using an RME Speech Clipper. RD went back to the 137-ft. all-band antenna fed with 600-ohm open line and antenna tuner and gets SWR 1:1 on all bands. WT monitors 7245 kc. all day. AKH will take traffic for Hatillo, Camuy and Arecibo on 7225 kc. WT takes Mayaguez traffic on 7245 kc. RE takes Arecibo traffic on 7245 kc. All stations guard 3925 kc. after 6 P.M. AST. We need regular stations from Ponce to accept Ponce traffic. AAA put up a full-length 80-meter antenna and works FB on 3925 kc. RM bought a 50-ft. crank-up tower to mount the Mosley beam and is awaiting arrival of a Heath Apache and Mohawk. CK/CL is trying out new s.s.b. gear on 15 meters using a cubical quad. ANY is a jet instructor in the Air National Guard. APN is a doctor in Veterans Administration. Traffic: KP4WT 63.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—A total of 10 amateurs participated in the S.E.T. exercise. Our problem was a simulated washout on the Canal, which took out the existing communications with Gamboa. On Nov. 1 Canal Zone amateurs participated in a telethon for the United Fund Drive. A control station was established at a local radio station and mobile units were stationed in the area to make collection of the pledges as they were called in. The thanks of the United Fund Chairman was extended to all amateurs participating. New appointees are RM as SEC; VR, CC, HO and DE as ECs; JJ as OBS; BG as RM; RU as PAM. BB left the Canal Zone Nov. 17 to make his home in Norfolk, Va. His call will be KK4AE. HC8GI is at present in the Canal Zone and mentioned that he has been receiving QSL cards from amateurs who claim to have worked him. He has not been on the air since 10/1/57. Therefore, anyone working HC8GI has been working an

(*Continued on page 148*)

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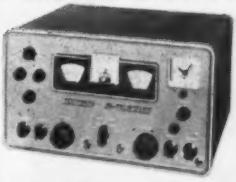
HAMMARLUND  HQ-145?

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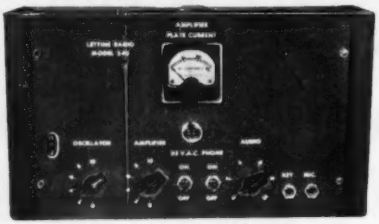

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SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: K6BWD and W6ORS. The following stations made BPL in October: W6GYH and K6HLR. Congrats, fellows! K6OQD is plenty busy with MCAN-7 and RACES. K6KYJ is doing a fine job as liaison from the c.w. to the phone nets. K6OJV, W6CIS, K6GLS, W6BES, W6JQB and many others were active in the CD Party. W6LVQ reports a fine S.E.T. in Whittier. W6MEP has overhauled the repeater station, K6MYK, with a transmitter frequency of 146.98 Mc. and receiver frequencies of 145.08 and 145.18 Mc. K6EA is back home after signing /MM for 2 months. W6BUK is the proud owner of a 75A-4. W6NKR got a couple of nice ones for new countries. The Inter-County Net, on 221.5 Mc., is growing fast. For informat on, contact K6GKX. W6CMN is back on with a Hy-Gain vertical. K6PBI has a 6-meter rig about to hit the air. The Whittier gang assisted the local police on 2- and 75-meter mobile on Halloween. W6ORS has his 2-meter RTTY running. W6OYM notes some fine 6-meter F2 openings to VE1, ZL and LU. Support your section nets—c.w., SCN on 3600 kc. at 1930 PST daily; phone, the SoCal Six Net on 50.5 Mc. nightly. Traffic: (Oct.) K6HLR 914, W6GYH 713, K6OZJ 330, K6LVR 326, W6BHG 114, K6OQD 112, K6OJV 106, K6PBI 54, W6NKR 37, K6KYJ 27, W6USY 26, W6CMN 24, K6TPL 23, W6BUK 8, K6GKX 6, W6ORS 6, K6EA 5, W6SRE 3, W6AM 2, W6CIS 2, W6ORZ 1. (Sept.) K6MCA 1718, K6LVR 239.

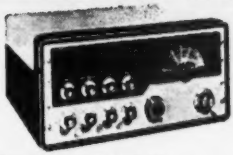
ARIZONA—SCM, Cameron A. Allen. W7OIF—SEC: YWF. PAM: CSN (3895 kc.): FMZ, UVR, Tucson, reports he has a new 15-kw. generator for his mobile and his OBS skeds are in full swing on c.w. RBF has his home station on the air at last. ACN has a new Tribander. The Desert Rabbit continues to grow with lots of dope on Yuma County. New officers of the AARC are FEW, pres.; QZH, treas.; UXZ, secy.; KOY, pub.; CAF, corr. secy.; FMZ, program; HXH, membership. Traffic: K7BWN 61, W7OIF 20, CAF 10.

SAN DIEGO—SCM, Don Stansifer, W6LRU—The following appointments are effective at the start of 1959 in this section. Asst. SCM: W6EWU. SEC: W6LYF. ECs: W6EOT, W6EWU, W6FVA, W6HRI, W6KSI, W6MUJ and K6HQJ. RM: W6EOT. OBSs: W6JVA, W6LRU, W6MUJ, K6BPI, K6THZ and K6TXR. OESs: K6BTO and K6OWV. OOs: W6SK, W6BKZ, W6CAE, W6LRU, W6MCY, W6MUR, W6WNN, W6ZVQ, K6EC, K6IPV and K6ZCR. OPSs: W6CHV and K6ZEE. ORSs: W6EOT, W6ISQ, W6LYF, W6UQF, K6EQL and K6UOD. If any others are interested in appointments, please let me know. A total of 112 stations in San Diego were active during the S.E.T., operating on four different bands, and a total of 27 messages were sent. The test was very successful, and a well-done to those participating is in order. K6ZCR is a new OO in Fullerton. K6THZ is a new OBS in Garden Grove. W7YKN/6, operating from the USO in Oceanside, handled traffic for his friends in the Marine Corps. His home QTH is Butte, Mont. The January meeting of the Helix Club will be a dinner meeting for installation of new officers. W6CHV and W6LRU now have both worked 250 or more countries postwar. W6RCD and K6TXR are new members of the San Diego DX Club. K6ENX was a recent visitor in San Diego. W6EWU is now using a DX-100. W6VNY is working good DX with QRP and a vertical. W6KSM handled the QSL chores for the FO8AT DXpedition to Clipperton which was sponsored by the San Diego DX Club. Seasons Greetings to all, and good hunting in 1959 from your SCM. Traffic: W6YDK 503, W6EOT 400, W6ELQ 101, K6ZCR 57, W7YKN/6 15.

SANTA BARBARA—SCM, Robert A. Henke, K6CVR—The Oxnard Radio Club held election of officers and W6KCD was elected president. The new EC of the Oxnard Area is K6OFO. W6YCF is going on 75-meter mobile. K6VDW finally got Santa Barbara via 2 meters from Arroyo Grande. W6OUL is planning a 20-meter beam. The Poinsettia Radio Club has been showing movies on receiver principles and transistors as a part of its regular meeting. A new "ham" in Lompoc is K6ERP who has a DX-100 and an SX-101 receiver. W6PWK burnt up his mobile rig, but should be back on the air soon. K6DXW was tired of low-power mobile rigs (5 watts) and really has gone high-powered, all 40 watts of it. The Santa Barbara Radio Club had its annual auction. K6KPU, president, said nothing was left except two empty cardboard boxes. At a recent S.B. PTA meeting a typical operating amateur radio station was put on display by W6PFF and W6ZSM. Equipment used was a Viking Ranger loading into a light bulb and 75A-4 receiver. Traffic: K6BVA 24, W6FYW 4, W6OUL 3, W6PWK 2.

(Continued on page 150)

ARROW ... Hamdom's One Stop Shop



Hallicrafters Model HT-32

Cleanest signal on the air! Hallicrafters HT-32 transmitter brings a new standard of clarity with two exclusive features: (1) 5.0 mc quartz crystal filter—cuts unwanted sideband 50 db. or more; (2) new bridged-tee modulator, temperature-stabilized and compensated network provides carrier suppression in excess of 50 db. SSB, AM or CW output on 80, 40, 20, 15, 11 & 10 meter bands. High-stability gear-driven VFO. 144 watts peak input. Ideal CW keying and break-in operation.
Amateur Net **$675.00**

Hallicrafters Model SX-101

New heavyweight champion! Rugged is the word for the SX-101 receiver—and it's all amateur. Heaviest chassis in the industry. Full gear drive. Complete coverage of 7 bands: 160, 80, 40, 20, 15, 11 & 10 meters. Special 10 mc. pos. for WWV. Tee-notch filter. S-meter functions with A.V.C. off. Selectable side band.
Amateur Net **$395.00**

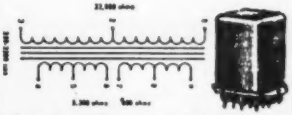
Sub-Miniature 0-200 Microampere Meter

A high quality instrument made by International Instrument Co. (Model 100). Only 1" in diam. Ideal for limited space applications & transistorized circuits. A natural for transistorized grid dip oscillator as described in June '58 QST.
Amateur Net $3.95 ea. **2 for $7.50**

2" round 0-500 microamperes. Bakelite case. Made by G.E. and Dejur.
Amateur Net $2.95 ea. **2 for $5.50**

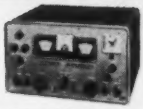
Weston 2" 0-4 amp RF meter Model 507. A giveaway at **$2.95 ea.** **2 for $5.50**

1½" sq. (ruggedized) 0-100 microamps.
$3.95 each **2 for $7.00**



Versatile Miniature Transformer

Same as used in W2EWL SSB Rig — March '56 QST. 3 sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22,000 ohms. (By using the centertaps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. Brand new. Fully shielded.
Amateur Net, each **$1.39**
3 for $3.49 **10 for $10.75**



Hammarlund HQ-145 Receiver

Feature-full and works like a charm. Offers unique combination of the Hammarlund crystal filter and well-known Hammarlund 60 db slot filter. In addition, from 10 mc to 30 mc, the HQ-145 has double conversion of the IF's, minimizing image response. 13 tubes. Continuous tuning from 540 kc-30 mc in four bands. Electrical bandspread is provided with calibrated markings on the 80, 40, 20, 15 & 10 meter bands.
Amateur Net **$269.00**
Amateur Net (With Clock)..... **$279.00**

Johnson 275 Watt "Matchbox"

For transmitters with maximum power input of 275 watts.
Model 250-23-3. With built-in Directional Coupler and Indicator. **$86.50**
Model 250-23. Less built-in Directional Coupler and Indicator. **$54.95**

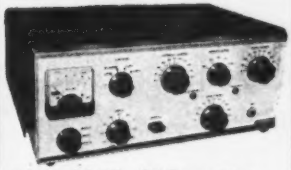
Kilowatt "Matchbox" — For transmitters with a maximum power input of 1000 watts. Antenna change-over system includes time delay circuit for relay, providing "fast make—slow brake" action.
Model 250-30-3. With built-in Directional Coupler and Indicator. **$149.50**
Model 250-30. Less built-in Directional Coupler and Indicator. **$124.50**

"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B&W 3013 Miniductor. Only 8 ft. long for 10 meters.
Amateur Net **$7.85**

Globe Linear LA-1

Complete with well-filtered power supply. 200w input AM Class B. 300w DC or 420 PEP input Class B linear SSB or DSB. 300w Class C for CW. Pi-Net 80-10 meters. 52 ohm Pi-Link coupled on 6 meters. Extensively TVI protected.
Amateur Net (Kit) **$99.50**
Amateur Net (Wired & tested) .. **$124.50**



Eico Model 720 CW Transmitter

Bandswitching 80 thru 10 meters. Provisions for external modulator & VFO. Uses 6146 in final. Power input: CW-90 watts (75 watt novice limit calibration on meter), 65 watts phone with external modulator; Pi net output matches 50-1000 ohms; all input & output leads by-passed for TVI suppression; clamper tube circuit protects final amplifier against loss of excitation; oscillator keying for break-in operation. 115 volt, 60 cycles. 15 x 5 x 9". Shpg. wt. 25 lb.
Amateur Net (Kit) **$79.95**
Amateur Net (Wired & tested)... **$119.95**

Eico Model 710 Grid Dip Meter

For pre-tuning and neutralizing transmitters, relative power indication, locating parasitics, antenna adjustment, correcting TVI and general de-bugging. All coils pre-wound and contained in rack. Illuminated rotating drum scale with 340° rotation. Frequency range: 300 kc-250 mc in 7 overlapping ranges. Exceptional stability; self-contained power supply operating on 115 volts. 2¼ x 2⅝ x 6⅞". Shpg. wt. 4 lbs.
Amateur Net (Kit) **$29.95**
Amateur Net (Wired & tested).... **$49.95**

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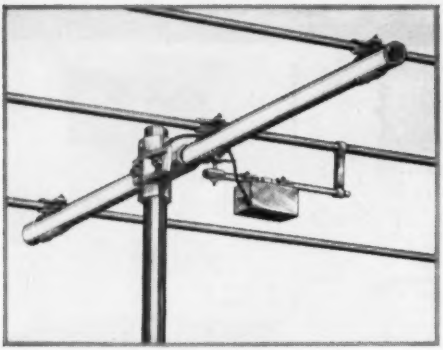

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Because our Plytubular Construction, a process of fabricating multi-ply aluminum booms and elements, permits smaller diameters for less ice loading, wind loading, vibration and torque. No struts or braces.

Better Match

Because our Tuneable RG and Coax-O-matic RGX gamma systems are constant, rain or shine. No coils, traps or baluns.

Better Price

Because we design for many years of service and guarantee against defective parts for a period of five years. The cost per year of a Tennalab Plytubular Beam is lower than any other, regardless of price.

Catalog No.	Bands	Elements	Amateur Net
9L-10152ORG	10-15-20	3-3-3	$217.50
6L-1015RG	10-15	3-3	105.00
6L-1020RG	10-20	3-3	157.50
6L-1520RG	15-20	3-3	165.00
13L-26RGX	2-6	8-5	65.00
2L-20RG	20	2	67.50
3L-20RG	20	3	107.50
5L-20RG	20	5	225.00
3L-15RG	15	3	65.00
5L-15RG	15	5	157.50
3L-10RG	10	3	55.00
5L-10RG	10	5	107.50
3L-6RG	6	3	37.50
5L-6RG	6	5	65.00
5L-6RGX	6	5	55.00
5L-2RGX	2	5	10.75
15L-2RGX	2	15	75.00
CR-2RGX	2	**	42.50

** Corner Reflector

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TENNALAB

QUINCY, ILLINOIS

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAMs: BOO and IWQ. RM: ACK. The Ft. Worth Hamfest was a success with more than 1500 registering and about 200 additional who did not register. The Brownfield Club put on its annual Swapfest Nov. 2, with 323 hams present. The Brownfield Award went to K5AWQ. NGX is going to Saudi Arabia. BFK is taking his place as Asst. NC for NWTEN. ILF has a code class going and hopes to organize a club in Levelland soon. NFO reports increased interest in NTO in West Texas. MBB is in the process of rebuilding. The Baylor Club station is moving into a dormitory. K5OJI, the Texas Instrument ARC of Dallas, has a Viking 500. BOO advises of 100 per cent NCS reports for the third consecutive month. SMK runs a grocery store in Ballinger and spends his time running from the ham set to the cracker barrel. Judging from his traffic reporf he is at the ham set more than the cracker barrel. KB6BJ visited RVI and left a written record of DX QSOs in the log book. CF is taking flying lessons. Dad is trying to get his antenna up in the air. With improvement in band conditions we notice more interference with traffic nets. These nets are performing a public service, so please try not to interfere with the operation of any net. Notice to all certificate-holders: Please check your renewal date and act accordingly. Traffic: W5SMK 298, BKH 142, BOO 96, PXV 62, JSN 53, BTH 30, K5ACD 27, GEC 20, LAC 20, W5BNG 15, KYM 10, VEZ 9, K5DNQ 7, JZK 6.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: K5KFS. RM: JXM. PAMs: DRZ and MFX. PAA sold his old equipment and is getting a new Collins station plus new antennas and building. New officers of the Northfork ARC are K5GTP, pres.; ZZP, vice-pres.; K5IZP, secy.-treas. FRB has started another class. He has started many a good ham in the hobby in years past. K5HXC and K5CXH are similar calls in Bartlesville. K5EJC received a YLWAC certificate. BNU, K5BPV and VVQ qualified for Sooner Traffic Net certificates. The Section Emergency Test activity in the section was rather low in participation. The local ECs need to get behind this test and push it as it is a wonderful time to show the local c.d. officials what ham radio offers them in emergency communications. Oklahoma again is fortunate in having a first-rate and active ham elected as vice-director of the division. I know KY will do a good job. Oklahoma's Ham of the Month: AQZ. Although a paralytic, Jack finds time to send in an OO report each month in addition to sending out his advisory notices. Traffic: W5DRZ 218, K5CAY, 163, W5VVQ 60, K5JGZ 58, INC 40, W5PNG 29, CCK 26, FEC 26, KY 24, MFX 23, MGK 23, FKL 18, K5LGV 17, W5VLW 16, ERI 15, K5CBA 11, BBA 9, W5EHC 7.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. PAM: ZIN. RM: K5BSZ. HKE is the new ORS at Houston. ETA, QKF, GMT, AQK, BKG, LMU and QEM attended the hamfest at McAllen. AQK and GMT had some very nice excuses for not finding the hidden transmitter. The members of the Magic Valley Amateur Radio Club are to be complimented on the fine time shown everyone. The Corpus Christi Amateur Radio Club had a fine S.E.T. drill under the direction of LOW, the EC for Corpus Christi and Nueces County. Congratulations to BNG, the new SCM for the Northern Texas section. Les is well liked among the ham fraternity, and certainly will be an asset to the League. Although TFP was in the Northern Texas section, we certainly hate to lose him to Kansas. Welcome to the Alame Heights High School Amateur Radio Club. The club call is K5PPZ. K5CRV has his Amateur Extra Class license while a senior in high school. Approximately 60 stations participated in the S.E.T. at Houston. K5OEA is a new ORS. Congratulations to the new San Antonio College Radio Club. New officers of the Houston Amateur Radio Club are KOD, pres.; K5BVG, vice-pres.; ID, treas.; FYW, secy. FYW is a new OO in Houston. QLT has been vacationing in W6-Land. I believe a word of caution is in order for the fellows working the low edge of 10 and 15 meters. It is possible, any day, to listen and log 4 to 8 stations out of the band, especially during the time when DX is coming through. These are not only new hams, although the majority are, but also you can hear some 2-letter calls. Don't forget, a v.f.o. will lose calibration and drift when cold. The FCC regulation says that both sidebands must be within the band limits. Traffic: K5OEA 432, W5EGD 271, AIR 138, ZIN 113, HKE 71, DYV 41, FCX 9, QLT 6, K5BYV 2, KN5QJR 2.

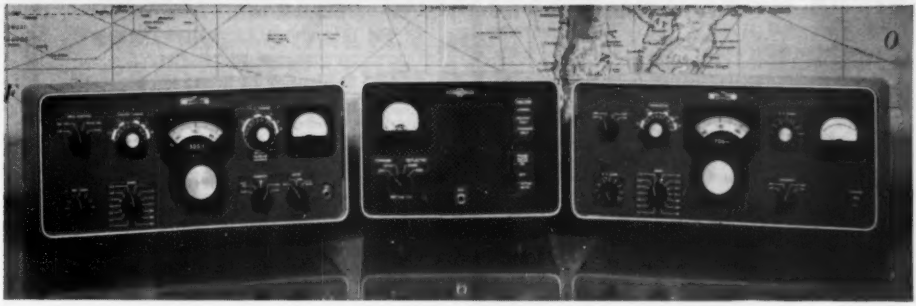
CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, 1OC. We regretfully announce the

(*Continued on page 152*)

Your Ham Headquarters – WASHINGTON to FLORIDA

SPECIALIZING IN THE BEST AT EASY TERMS
HIGH TRADES AND LOW DOWN PAYMENTS
WRITE FOR DETAILS OF OUR TIME PAYMENT PLAN



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Smaller (only 6⅞" high) and more compact, the new S/Line maintains superior Collins standards in performance and operating convenience. Improved and simplified single sideband design incorporates time-proven features of the KWM-1, KWS-1 and 75A-4.

Send for illustrated 4-page brochure containing all technical specifications.

Collins new S/Line is now on display at all three of our locations. Call, wire, write or stop in.

S/Line Net Prices

32S-1 Transmitter	$590.00
75S-1 Receiver	$495.00
30S-1 Linear Amplifier w/power supply	TBA
516F-2 Power Supply	$105.00
312B-4 Speaker Console	$185.00
312B-3 Speaker	$ 27.50

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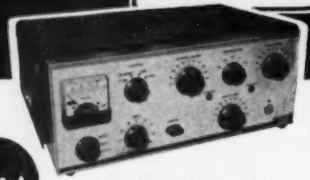

New

90-WATT CW TRANSMITTER . . #720
KIT $79.95 WIRED $119.95

Conservative, highly efficient design plus stability, safety, and excellent parts quality. 80 thru 40, 20, 15, 11, 10 meters (popular operating bands) with one knob band-switching. 6146 final amplifier for full "clean" 90 W input, protected by clamper tube. 6CL6 Colpitts oscillator, 6AQ5 clamper, 6AQ5 buffer-multiplier, GZ34 rectifier. "Novice limit" calibration on meter keeps novice inside FCC-required 75W limit. No shock hazard at key. Wide range, hi-efficiency pi-network matches antennas 50-1000 ohms, minimizes harmonics. EXT plate mod. terminals for AM phone modulation with 65W input. Excellent as basic exciter to drive a power amplifier stage to max. allowable input of 1KW. Very effective TVI suppression. Ingenious new "low silhouette" design for complete shielding and "living room" attractiveness. Conservatively rated parts, copper-plated chassis, ceramic switch insulation. 5" H, 15" W, 9½" D.

NEW UNIVERSAL MODULATOR-DRIVER #730
KIT $49.95 WIRED $79.95 Cover E-5 $4.50

Superb, truly versatile modulator at low cost. Can deliver 50 W of undistorted audio signal for phone operation, more than sufficient to modulate 100% EICO #720 CW Transmitter or any xmitter whose RF amplifier has plate input power of up to 100W. Multi-match output xmfr matches most loads between 500-10,000 ohms. Unique over-modulation indicator permits easy monitoring, no need for plate meter. Lo-level speech clipping & filtering with peak speech freq. range circuitry. Low distortion feedback circuit, premium quality audio power pentodes, indirectly heated rectifier filament. Balance and bias adj. controls. Inputs for xtal or dynamic mikes, etc. Excellent deluxe driver for high-power class B modulation. ECC83/12AX7 speech ampl., 6AL5 speech clipper, 6AN8 ampl. driver, 2-EL34/6CA7 power output, EM84 over-mod. indicator, GZ34 rect. Finest quality, conservatively rated parts, copper-plated chassis. 6" H, 14" W, 8" D.

NEW GRID DIP METER . . . . . #710
KIT $29.95 WIRED $49.95 including complete set of coils for full band coverage.

Exceptionally versatile. Basically a VFO with micro-ammeter in grid: determines freq. of other osc. or tuned circuits, sens. control & phone jack facilitate "zero beat" listening. Excellent absorption wave meter. Ham uses: pretuning & neutralizing xmitters, power indication, locating parasitic osc., antenna adj., correcting TVI, de-bugging with xmitter power off, determining C,L,Q. Servicing uses: alignment of filters, IF's; as sig. or marker gen. Easy to hold & thumb-tune with 1 hand. Continuous 400 kc–250 mc coverage in 8 ranges, pre-wound 0.5% accurate coils. 500 ua meter movement. 6AF4(A) or 6T4 Colpitts osc. Xmfr-operated sol. rect. 2½" H, 2⅞" W, 6⅞" L. Satin deep-etched aluminum panel; grey wrinkle steel case.

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resignation of AEB as SEC and wish to take this opportunity to thank him for his excellent work in that post. Newly-elected club officials include: (Dartmouth) TU, pres.; FK, vice-pres.; TV, secy.; Mrs. D. Porter, treas. (Halifax) WL, pres.; HY and SF, vice-pres.; C. G. Fisher (ex-3EA), secy.; QV, treas. W2ZRX/VO1 is now Route Manager for the VO1 District. Congratulations to ABF and his XYL on the arrival of a new YL. C.d. operations in the Springhill Mine Disaster found NZ/m, TT/1, XK, QM, ADH, HY, ABF, FQ, AV and HH supplying emergency communications. IF has his complete station in an old Hudson Bomber. Don't forget the 5th Annual VE1 contest, Jan 24 and 25. Six-meter operation is on the increase in Newfoundland. Ex-ET is now 3CLJ and ex-QZ, now 3CRA, has received an important promotion in Defense-Research, Ottawa. PQ reports working 76 countries on s.s.b. with 226 on c.w. QC has a new KWS-1 in operation. Please assist your SCM by sending your station activities and traffic reports in early. Traffic: VE1OM 30, AEB 4.

FIFTH ANNUAL VE1 CONTEST

January 24-25, 1959

All VE1 amateurs are invited to participate in a contest sponsored by the New Brunswick Amateur Radio Association. The highest-scoring contestant will be given an engraved cup, the New Brunswick Amateur Radio Association Trophy, and will have permanent possession of same.

Rules: 1) The contest will begin at 8:00 P.M. AST, Saturday, Jan. 24 and end at 8:00 P.M. AST Sunday, Jan. 25. 2) Any and all amateur bands may be used. Phone-to-c.w., phone, c.w. and cross-band contacts are permitted. 3) The same station may be counted but once for credit, regardless of band worked. Mobile, portable and home stations covered by the same station license constitute the same station. 4) The general call will be CQ VE1. 5) Exchange signal report, county and province and operator's name. Local QTH is not required. 6) Logs should show band, signal reports, county, province, time and date. 7) Score one point for information received and one for information sent. Multiply total points by the number of individual counties worked in the three provinces concerned, to determine final score. 8) Decisions of the contest committee will be final. Logs must be postmarked by Feb. 8 and should be in the hands of the committee not later than Feb. 15. Send them to W. H. Smith, VE1FC, Contest Committee Chairman, 173 Broad Street, Saint John, New Brunswick, Canada.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The ARRL Ontario Provincial Convention was a huge success with over 300 hams attending. Congrats, gentlemen of the Hamilton Club. A good time was had by all. Eighteen more members were initiated into the Royal Order of the Wouff-Hong. It is rumored that next year's convention may be at Windsor. AML reports that he received an elaborate ash tray from boys at the 56th Squad. Sigs overseas. The following are the officers of the Algoma RC for the coming season: AXH, pres.; EOW, vice-pres.; AOG, secy.; ALV, treas. EOV and EOW are newcomers to the phone bands. DCI is s.s.b., DCX is now in Barrie. News has it that Elliott Lake may soon have a radio club. After 13 months on the air, CFR has already earned his WAC, RCC and WAS certificates. CFK is now at Earlton. CNB has a new receiver and worked VK4 and HB9 right off. DQX tells us that the winter program of the Metro RC of Toronto is of the best. The following are officers for '58/'59: ALB, chairman; CDX, vice-chairman; DOQ, rec. secy.; DQX, corr. secy.; DSM, treas. The Timmins group has now received its c.d. equipment. DSX is in charge. DMI is going to Studio "B" (meaning basement). CJO is on 10 meters. AKL is a newcomer to Timmins. JZ has worked 218 countries. Anyone better? BTI has 118 countries on 15-meter phone. BSA was a visitor to Northland. Down London way, Bud Remick is now 3COB. Congrats to "Crazy ole Bud." Hi. AJP has an Apache and is moving to the sticks. CHQ, of Windsor fame, is now QTH London. The Windsor ARC has a wonderful club paper edited by Wally Walker. Traffic: (Oct.) VE3NG 132, EII 108, GI 85, DEX 65, DTB 61, NO 61, DPO 49, DUU 43, AML 38, DTO 36, CFR 32, CHF 30, AOE 28, DZA 22, EIH 22, ELU 17, RW 13, AVS 11. (Sept.) VE3RW 10.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Those seeking VE2 for WAVE may try: 80—88 and AKS (100

(Continued on page 154)

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Stan Burghardt WØBJV

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16.	Eldico SSB 1000 Linear	425.00
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18.	Elmac AF-67 Transmitter	139.00
19.	Elmac PMR 6 Receiver	60.00
20.	Elmac PMR 7 Receiver	110.00
21.	Globe Chief 90 Transmitter	49.00
22.	Globe Chief 90A Transmitter	59.00
23.	Globe DSB-100 Transmitter	110.00
24.	Globe King 400C Transmitter	250.00
25.	Globe LA-1 Linear Amplifier	100.00
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27.	Globe Scout-65A Transmitter	54.00
28.	Globe Scout-680 Transmitter	89.00
29.	*Gonset 3003 1.6-6mc Converter	30.00
30.	Gonset 3063 2mtr Linear	95.00
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33.	Gonset Tri-Band Converter	25.00
34.	Hallicrafters HT-18 VFO Exciter	35.00
35.	Hallicrafters HT-32 Transmitter	550.00
36.	Hallicrafters SX-25 Receiver	55.00
37.	Hallicrafters SX-62A Receiver	225.00
38.	Harvey Wells R-9 Receiver	$89.00
39.	Harvey Wells TBS-50C with supply	59.00
40.	Heath AT-1 Transmitter	20.00
41.	Heath AR-2 Receiver	20.00
42.	Heath DX-35 Transmitter	39.00
43.	Heath VF-1 V.F.O.	15.00
44.	Johnson Ranger Transmitter	199.00
45.	Johnson Viking II Transmitter	200.00
46.	Johnson Valiant Transmitter	375.00
47.	Johnson "500" Transmitter	650.00
48.	†Johnson Navigator Transmitter	135.00
49.	Johnson 6N2 Transmitter	129.00
50.	Johnson 250-132 2mtr VFO	25.00
51.	Johnson 122 VFO	29.00
52.	Johnson 250-23 Match Box	39.00
53.	Johnson 250-33 Audio Amplifier	59.00
54.	*Kwikpatch KWP-4 Phone Patch	15.00
55.	National HRO-7 6-coil, Spkr.	149.00
56.	National HRO-50TI 5-coils	225.00
57.	†National NC-66 Receiver	90.00
58.	National NC-88 Receiver	90.00
59.	National NC-100A and Spkr.	55.00
60.	†National NC-109 Receiver	149.00
61.	National NC-183D Receiver	249.00
62.	†National NC-188 Receiver	117.00
63.	National NC-300 Receiver	275.00
64.	†National NC-300 Receiver	315.00
65.	RME 4300 Receiver	150.00
66.	†RME 4350A Receiver	189.00
67.	RME VHF-152A Converter	39.00
68.	*Tapetone XC-144N Converter	59.00
69.	Telrex R-100B Rotator and Indicator	59.00
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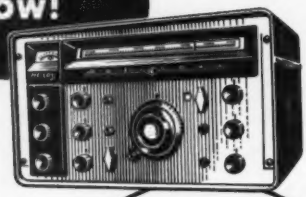

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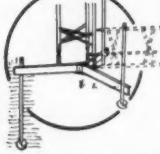

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watts 3720 kc.); 40—AFZ; 20—AAK, AXR, AOJ, DS, AVR (ex-ON4VC), AXZ (quad), ABE, EE (75A-4, KWS-1 with beam); 15—DR, YU, JZ, BK, ANZ; 10—IJ, AFI. QV is looking for guided missile fans. KL (ex-VE8NB) is KB's son. VN has phone endorsement. XO is s.s.b. on 80 meters. ICY is in Montreal. APC has a new 15-element beam on 2 meters. ABU and SC enjoy mobiling. AHH returned to 80 meters and AVC (ex-DL4) also enjoys this band. We regret the passing of AD and ex-LZ. Mobiles AZT, AIB, AUU, AIS and ASW were active relaying traffic during the recent Quebec-Montreal Bicycle Races. NR and EF are members of the so-called "weaker sex." AWA has a new CDR rotor. ATL is proud of the new Ranger and 6N2 and was visited by ex-G2DCI/VK2DCI. ADP (cop) used to chase mobiles, handing them a QSL. Welcome newcomers are ARL, AFN, AGH, AGM, AGS, IP, BAC, AHN and ANH. A line to your SCM will always be appreciated. AHW and his XYL enjoyed a visit to W1AW. He now is QRL rebuilding the v.f.o. FLASH: Is WW the first ham in the world with a full-sized 40-meter quad? Quite a monster! AJP also is F8PC and is active on 20 meters and looking for F stations. BG and BE have a 420-Mc. converter for ham TV Our sincere thanks to ABE and AWD for their great assistance in securing news. YA is erecting a tower for the new Mosley 3-bander. BK also is switching to this type beam. HA4EA/HA4SA now holds the call VE2AZQ. VI and ACS are planning to go on 2 meters. Your SCM has applied for DXCC and wishes you all a very prosperous 1959. Traffic: VE2DR 93, EC 39.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—PAM: OD. PQ advises that the 2-meter transmitter construction group meets in the C.D. Center Wed. evenings. JQ, TK and 3VP acted as net control for operation "Broomstick" with DV, WT, HQ, JK, DX, JV, AX, XB, WL and TY aiding police with mobile coverage of Calgary on Halloween. Thanks to WG for the only report received from outside the city this month. Where are all the reports? Must this column be dropped or edged in black? Traffic: (Sept. and Oct.) VE6HM 192, TT 43, OD 28, SE 7, PZ 5, PV 3, BA 2.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—Hope you all had a good Christmas season and can start the New Year off with a bang. There should be some new rigs, etc., being talked about and tried out with Christmas past. The BCEN on 3650 kc. still is gathering more check-ins with about 30 now checking at various times. ALY and AOL now have ORS appointments. The voice of Chapman Camp seemingly is hibernating on 40 meters where he finds lots of other long-winded fellows for QSOs but still he checks the AREC, Alberta AREC and the Saskatchewan AREC. That is, when he can hear anything at his QTH. With ALY putting forth a potent signal with that new Apache and APH hearing things he never knew were on the air with his new "sooper-dooper special," things are progressing in the ham fraternity. All we need now are QTHs free from QRN and the neighbors ITV. AAV recently returned from an "Astronomical Convention" held in Moscow, Russia. He was one of the Canadian representatives, being in the field of photo-electric astronomy. One thing that would help out is that club activities be reported. I know that there are some worthwhile projects under construction and some members working as instructors for upcoming hams but nobody ever hears about them so they go along without any recognition. Traffic: VE7-TF 112, AAF 36, AD 16, AIO 3.

MANITOBA—SCM, James A. Elliott, VE4IF—An invitation to the general public brought out many visitors at the last meeting of the ARLM. Don Jackson, our president, gave an interesting outline of ham radio, assisted by JW, UR, HB, LO, GC, CP and BG. A newcomer to Winnipeg is VK3AMH. Ham activity has been on the increase at Ft. Churchill. W3MCG/VE4 made 108 contacts in 3 hours 8 minutes during the October CD party. K3CLG/VE4, W3MSK/VE4, W3MCG/VE4, K9AOL/VE4 and K5AKD/VE4 also are active at Churchill. W3MCG works 14, 21 and 28 Mc. with two- and seven-element beams which stay up despite winds up to 70 knots. JW has repaired the beam rotator and is operating a DX-40 on 10 meters. JU, at Point du Bois, has a DX-40 on 10 meters. MJ is working on the modulator. GB is moving back to Seven Sisters as plant superintendent. MI has completed the beam and should be back on the air by now. AY has moved to a new QTH. MH is a new call on 75-meter c.w. BB has gone back to the University. SA has been active on 10 and 20 meters. Kay and Jack, KL and LO, are working on their WAW. Keep the activity reports coming, gang. Traffic: VE4GE 25, JY 24, KL 23, RB 12, AN 10, VE5LK 10, VE4RR 6, KN 2, KK 1.

SASKATCHEWAN—SCM, Lionel O'Byrne, VE5LU—LM has a new tower for his beam. RE has now received the transformer for his NC-183D. MF of Govan broke his arm while combining. GG has a new receiver and preselector. AS has a new Viking Valiant. CM/4 will report home soon. BN and JO have Apache transmitters.

(*Continued on page 156*)

Everybody's Raving about the

HERE'S WHAT THEY'RE SAYING ABOUT THIS EXCITING NEW SIDEBAND TRANSMITTER:

I have used the DSB-100 for the past two months both "barefoot" and as exciter for a grounded grid linear amplifier. Signal reports have been excellent, especially from the standpoint of quality.
Floyd Peck, K6SNO
San Jose, California,

The DSB is a beautiful job. After reading the very simple instructions, bearing in mind it is the first time I have seen a sideband transmitter, I put it on the air within twenty-five minutes, and the result was something amazing. After giving the CQ call, we had over 20 replies on the same frequency from state side . . . Double Sideband does the job.
Tom Thompson, VP1SD
British Honduras

I particularly like the DSB-100 as it tunes the MARS frequencies and CAP. We work 5850kc MARS frequency all over Third Army Area. It's the hams' answer to sideband at a cheaper cost. I'm really sold on the DSB-100 and think it's a swell buy for any ham for DSB or AM.
G. A. Whittington, W4DWG

Ease of operation and maintenance is of first importance when the chips are down, and your design employs what is needed for these. The DSB-100 has plenty of sock on AM and DSB, and it performs perfectly with my standard VFO. It has great versatility.
James H. Long, W5PNB

I get S9 plus reports on my DSB-100 Xmttr. It is amazing what it will do on AM, CW and DSB.
Conrad Young, W4CEF/A4CEF

Every single contact (logged on 40 Meters) had the same favorable comments to make:
1. Signals were strong and exceptional.
2. Audio quality was excellent.
3. Excellent when necessary to switch sideband.
4. Terrific sock barefoot.
you have a real winner.
Henry J. Console, K6ZPY - K6BCA

Since I received my DSB-100 my average number of solid QSO's has more than tripled. I have had the pleasure of joining and holding my own in numerous kilowatt round-tables throughout the states. With my DSB-100 and LA-1, I have twenty-one times the power for the same cost (in comparison with other rigs).
William L. Harrison, W5HNA/3

At last a sideband rig a low income ham can afford. Audio reports are excellent with good punch.
Robert Healey, W1STW

I give the Sidebander an A+. Everybody I talk to thinks I'm on SSB. A very potent rig on CW and AM also. I've worked HSIC, ZD7SA, 2K2AB, YVOAB, VK2AYY/CH and many other rarities.
Scotty Redd, K6DQI

. . . results obtained by using sideband with the DSB-100 are amazing. I am well pleased with the fine transmitter, but most of all with the price.
Herman M. Hattaway, W5FJR

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Self-Contained • Built-In Power Supply for 3 Modes: - Sideband, AM & CW

LOW COST

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- ★ Bandswitching, 80-10M, ready to go. Continuous band coverage 3-9mc and 12-30mc; covers all popular MARS and CAP frequencies.
- ★ Adapts to present AM equipment (uses standard crystals, regular VFO); higher power available when coupled with King or Champion.
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- ★ Exclusive automatic balancing and floating grid circuit insures minimum of 45 db carrier suppression on all bands. If one sideband QRM'ed, receiving station can switch to other.
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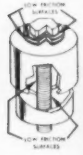

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NS is active on 10, 15 and 75 meters in Regina. WG has a GZ4U beam and will be operating this winter. On Nov. 2 an RCAF medical group and a road group arrived in Lloyminister at 10 A.M. and departed at 1700. Amateurs taking part were FX, VZ, PV, BI, BF, AS, 6CA and 6BC. XX and his XYL, YY, with the family spent their holiday in VE6-Land, taking time to go to Edmonton for the hamfest. Both report a swell time and a nice trip. EQ can't get his 3780 crystal to work on 3780 kc. Hi, Lloyd. JW is getting DXitis since his recent operation and sojourn in the hospital. JK has a new Austin and is busy getting a rig to fit in it. Thanks for the nice bit of news, fellows. Keep it up. Traffic: VE5-LM 28, IJ 8, QL 8, RE 6, EQ 4, GO 4, CB 2, HF 1.

Calibrating S.W.R. Bridges

(Continued from page 47)

tions of fixed capacitors.

For somewhat higher accuracy than the proportional-rotation method of estimating capacitance described above by the author, the variable capacitor can be calibrated as described in the chapter on measurements in the *Handbook*, using a standard inductor and grid-dip meter. For most work this is probably an unnecessary refinement, if a straight-line capacitance variable is used and allowance is made for the fact that the capacitance has a minimum value at the "zero" setting. QST

DX Competition

(Continued from page 80)

recognition will be made as follows:

a) A certificate will be awarded to the high-scoring single-operator phone and to the high-scoring single-operator c.w. entrant in each country (as shown in the ARRL Countries List) and in each of the mainland U. S. and Canadian ARRL sections (see page 6 of any *QST*) from which valid entries are received. In addition, a certificate will be awarded to the high-scoring multiple-operator station in each section or country from which three or more valid multiple-operator entries are received.

b) A suitable certificate will be awarded to the operator making the highest single-operator phone score in each ARRL-affiliated club, provided the club secretary submits a listing of a minimum of three phone entries by members of the club and that these scores are confirmed by receipt at ARRL of the individual contest logs from such members. The highest single-operator c.w. scorer in each club will be awarded a certificate under the same conditions. Only a bona fide resident member, operating a station in local club territory, may compete for club certificates.

c) ARRL will award a gavel to the affiliated club submitting the greatest aggregate phone and c.w. score by its members, whether single- or multiple-operator entries, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members. Only scores of bona fide resident members, operating stations in local club territory, may be included in club totals.

13) *Judges:* All entries will be passed upon by the ARRL Award Committee, whose decisions will be final. The Com-

(Continued on page 158)

TOWERS

ALL THE WAY - IT'S EZ WAY

See Page 112

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Dual Conversion: 12 Tube superheterodyne circuit **Frequency Range:** Full dial coverage of 6, 10, 15, 20, 40, 80 and 160 meter amateur bands. **Single Sideband:** Separate linear detector for optimum reception of SSB and CW. **Q-Multiplier:** Permits continuously variable selectivity. **Beat Frequency Oscillator:** Separately stabilized. **Stable:** Voltage-regulated, temperature-compensated high-frequency oscillator. **Crystal Control:** 2nd conversion oscillator crystal controlled.

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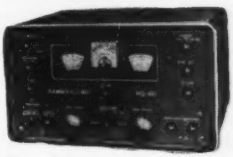
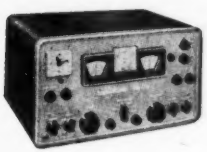


HAMMARLUND HQ-160

Dual Conversion: 13 Tube superheterodyne circuit. **Frequency Range:** 540 KCS to 31 MCS in six bands. **Single Sideband:** Separate linear detector for optimum reception of SSB and CW. **Q-Multiplier:** Permits continuously variable selectivity to meet all operating conditions. **Bandspread:** Electrical, with calibrations of 80, 40, 20, 15 and 10 meter bands **Crystal Calibrator:** Built-in 100 kc. **Dial scale Reset:** Adjustable calibration on front panel for precise settings.

$379.



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Triple Conversion: 17 Tube superheterodyne with automatic noise limiter. **Slot Filter:** 1.5 KCS at 6 db. Adjustable ± 5 KCS over passband for better than 40 db attenuation. Added attenuation of 20 db at any point by Slot Depth Control. **Separate Linear Detector:** for CW and SSB, plus normal diode AM detection. **Tuned IF Amplifier:** Seven selectivity positions provide mechanical filter-type skirt selectivity. Sidebands selected from front panel.

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Works with any receiver having an IF between 450 KCS and 500 KCS. Completely self-contained. Requires only input and speaker connection. Tuned IF amplifier with seven selectivity positions having mechanical filter type skirt selectivity. Vernier type passband tuning control ± 3 KCS for easy SSB reception. Razor sharp slot filter adjustable ± 5 KCS over passband for better than 40 db attenuation of unwanted signal. Additional attenuation up to 20 db at any point by slot depth control. Fast attack time AVC with off-slow-medium-fast decay speeds. Selected from front panel.

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mittee will void or adjust entries as its interpretation of these rules may require.

14) *Disqualifications:* Each participant agrees to observe the contest rules as well as all regulations established for amateur radio in his country. Violation of any regulation, as confirmed by a single FCC citation or advisory notice or two ARRL accredited Official Observer reports, may constitute grounds for disqualification. Some examples of practices which can result in disqualification: off-frequency (out-of-band) operation, harmonics, spurious emissions, low tone reports in logs, key clicks, splatter, excessive sidebands, W (K) stations working banned countries. QST

Novice Roundup

(*Continued from page 77*)

entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Roundup report a copy of qualifying run from W6OWP, January 8 or February 4, or from W1AW, January 21 or February 19. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points" plus "Code Proficiency credit" multiplied by the "section multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Roundup reports become the property of ARRL and must be postmarked not later than March 16.

6) *Awards:* A certificate award will be given to the highest-scoring Novice in each ARRL section.

7) *Disqualifications:* Failure to comply with the contest rules or FCC regulations shall constitute grounds for disqualification. ARRL Contest Committee decisions are final. QST

"Q-Less" L Networks

(*Continued from page 15*)

Example: Suppose you measured the input impedance to your loaded vertical antenna as 15 ohms and wanted to match it to a 75-ohm feedline.

$$\frac{R_p}{R_s} = \frac{75}{15} = 5.$$

For this value of R_p/R_s, Fig. 1 shows that D = 0.4, B = 0.5, C = 2, and A = 2.5.

Using the formulas shown in the box of Fig. 1,

$X_s = 2 \times 15 = 0.4 \times 75 = 30$ ohms.

$X_p = 2.5 \times 15 = 0.5 \times 75 = 37.5$ ohms.

As a check, Curve E shows that X_p/X_s should be 1.25. Then,

$$\frac{37.5}{30} = 1.25$$

The same network could be used to step a 75-ohm load down to 15 ohms by reversing the input and output ends.

Curves A and D, incidentally, reveal these interesting (though probably useless, except for checking) bits of information:

1) X_p can never be smaller than twice the smaller resistance being matched.

(*Continued on page 160*)

TOWERS

ALL THE WAY - IT'S EZ WAY

See Page 112
WORLD RADIO LABORATORIES
COUNCIL BLUFFS, IOWA

UNDER THIS COVER!

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Fifteenth Edition

AC & DC CIRCUITS — VT PRINCIPLES — TRANSISTORS & SEMI-CONDUCTORS-VT AMPLS. — HIGH FIDELITY — Hi-Fi Ampl.; Baby Hi-Fi; High Quality 25-W Ampl. — RF VT AMPL. — OSCILLOSCOPE — SPECIAL VT CIRCUITS — ELECTRONIC COMPUTERS — RECEIVER FUNDAMENTALS — RF ENERGY GENERATION — RF FEEDBACK — AMPLITUDE MODULATION — FM & RADIO TELETYPE TRANSMISSION — SIDEBAND TRANSMISSION — TRANSMITTER DESIGN — TV & BC INTERFERENCE — TRANSMITTER KEYING — RADIATION, PROPAGATION & TRANSMISSION LINES — ANTENNAS — End-fed and Center-fed Half-Wave Horizontal, Half-Wave, Ground Plane, Marconi, Space-Conserving, Multi-Band Ant.; Matching Non-Resonant Lines to Ant.; Ant. Construction; Coupling to Ant. System; Couplers; Single-Wire Ant. Tuner — HF ANTENNA ARRAYS — VHF & UHF ANTENNAS — ROTARY BEAMS — MOBILE EQUIPMENT — RECEIVERS & TRANSCEIVERS — Simple Transistorized Portable BC Recvr.; 455 Kc. Mechanical Filter Adapter; High Performance Amateur Band Recvr.; "Handie Talkie" for 144 Mc.; 6 Meter Transcvr. for Home or Car; "Hot" Transcvr. for 28 Mc. — LOW POWER TRANSMITTERS & EXCITERS — SSB Exciter for Fixed or Mobile Use; Mobile Transistorized SSB Exciter; VHF Transcvr. of Advanced Design; Miniaturized SSB Transmitter for 14 Mc.; Duplex Transmitter-Recvr. for 220 Mc.; High Stability VFO for the DX Operator — HF POWER AMPLS. — Push-pull Triode & Tetrode Ampls.; Inexpensive Cathode Driven Kw. Ampl.; Compact Linear Ampl. for Mobile SSB; Multi-band Mobile Linear Ampl.; 2 Kw. P.E.P. All-band Ampl.; High Power Push-pull Sideband Linear Ampl.; Kw. Ampl. for Linear or Class C Operation; Zero Bias Tetrode Modulators — Tetrode Ampl. — SPEECH & AM EQUIPMENT — General Purpose Triode Class B Modulator; Deluxe Transmitter for the 3.5-29.7 Mc. Range — POWER SUPPLIES — 100-W Mobile Power Supply; Transistorized Power Supplies; 2 Transistorized Mobile Power Supply; 500 V., 200 Ma. Power Supply; 1500 V., 425 Ma. Power Supply; Dual Voltage Transmitter Supply; Kw. Power Supply — WORKSHOP PRACTICE — ELECTRONIC TEST EQUIPMENT — Measurement of Circuit Constants; Measurements with Bridge; Freq. Measurements; Ant. and Transmission Line Measurements; Simple Coaxial Reflectometer; Measurements on Balanced Transmission Lines; "Balanced" SWR Bridge; Antennascope; Silicon Crystal Noise Generator — RADIO MATHMATICS & CALCULATIONS

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2) X_s can never be larger than half the larger resistance being matched.

3) For either X_p or X_s there are two different values of R_p/R_s which call for the same value of shunt or series reactance; e.g., $X_p = 2.5\ R_s$ at $R_p/R_s = 1.25$ and at $R_p/R_s = 5$.

Fig. 1 allows you to double check by using two different methods to reach the same answer. It aids in visualizing the relative sizes (in ohms) of the elements, and lets you make a final check on accuracy by looking at the ratio of X_p to X_s.

May you find it helpful!

Technical Correspondence

(*Continued from page 36*)

and amateur coverage.

Second, antenna considerations. These vary considerably with the shape and style of the vessel; e.g., sail or power.

Third, reduction of d.c. motor, generator, alternator and regulator noises, and ignition shielding. The vehicle body automatically alleviates this problem in normal mobile work.

Fourth, bonding methods for tanks, lines and motor, both for noise reduction and electrolysis mitigation (in salt water) and the use of external hull ground plates, etc.

Without question, a number of hams work daily on marine radio and their answers to these problems could be most enlightening to your interested readers. So here's hoping this letter generates some enthusiastic results.

— Dudley Meakin, VE7RV

SIDEBAND PACKAGE MODIFICATIONS

4290 Beulah Drive
La Canada, Calif.

Technical Editor, *QST:*

Since the article, "A Sideband Package," was published (*QST*, June, 1958), a few changes have appeared desirable.

1) The low-frequency oscillator, V_{1A}, should have an unbypassed 820-ohm ½-watt resistor added in the cathode lead to ground. It is also preferable to supply the grid of V_{4A} from this cathode instead of from the cathode follower as the balanced modulator tends to modulate slightly the r.f. to the multiplier when connected to the cathode follower.

2) The 6AU6 low-frequency amplifier, V_2, should be a 6BA6 for proper limiter operation. Socket connections are unchanged.

3) A parasitic choke consisting of 4 turns of No. 18 wire on a 100-ohm 2-watt resistor should be added in the plate lead of the 6146.

— George K. Bigler, W6TEU

V.H.F. Party Results

(*Continued from page 49*)

KØGIA.....90- 30- 3-B
WØHAJ.....33- 11- 3-B
WØMOX.....28- 7- 4-B
WØIIJ.....18- 6- 3-B
KØLGW.....6- 6- 1-B

Missouri

WØIHD.....88- 22- 4-B
KØJZL.....34- 17- 2-A
KØAXU[3] (WØWEQ, KØs CRR (CVS).....368- 92- 4-A
KØQQC (9 oprs.) 204-102- 2-A
KØLLC (KØs KWJ KWL LLC).....104- 52- 2-A

Nebraska

KØCIA.....52- 26- 2-A

NEW ENGLAND DIVISION

Connecticut

W1RJA 10,592-331-32-AB
W1PHR..3926-151-26-AB
K1BOL..2352-112-21-AB
W1HDQ[4] 2184- 71-24-AC
W1YDS..1500- 89-16-ABC
K1CAP..1443-111-13-B
W1TXI..1300- 65-20-AB
W1LGE..924- 66-14- -
W1BYX[3] .600- 50-12-A
K1CKZ/1 .570- 57-10-A
K1BML..504- 56- 9-B
W1IPV..495- 55- 9-B
KN1IMI[3] 392- 56- 7-B
W1FBL/1 288- 32- 9-A
W2GKR/1 238- 34- 7-A
KN1DZL..156- 52- 3-B
KN1HHY/1 100- 25- 4-B
W1HDF....50- 7- 5-ABCD
KN4TID/1 44- 22- 2-B
KN1GHO/1 40- 10- 4-B
W1YOL....26- 13- 2-A
W1DHT[3] (9 oprs.) 4117-179-23-AB
W1FSE (W1s FSE ZIF) 3276-156-21-AB
K1CRQ. (K1s CRQ GTZ) 2736-171-16-B
W1LAS/1 (6 oprs.) 2560-128-20-AB

(*Continued on page 162*)

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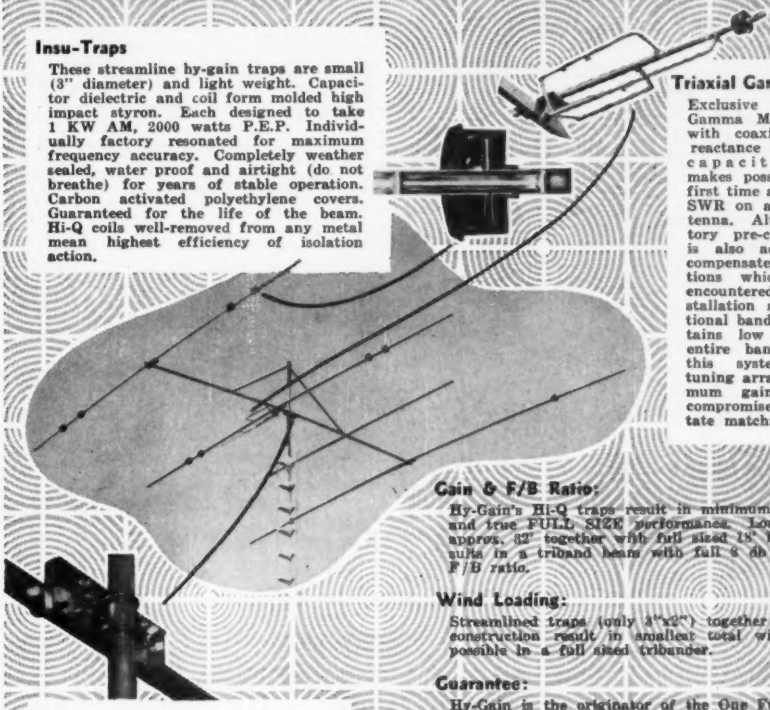
These streamline hy-gain traps are small (3" diameter) and light weight. Capacitor dielectric and coil form molded high impact styron. Each designed to take 1 KW AM, 2000 watts P.E.P. Individually factory resonated for maximum frequency accuracy. Completely weather sealed, water proof and airtight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. Guaranteed for the life of the beam. Hi-Q coils well-removed from any metal mean highest efficiency of isolation action.



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Exclusive Triaxial Gamma Match system with coaxially formed reactance cancelling capacitor built-in, makes possible for the first time a perfect 1:1 SWR on a 3-band antenna. Although factory pre-calibrated, it is also adjustable to compensate for variations which may be encountered at each installation site. Exceptional bandwidth maintains low SWR over entire band. Use of this system permits tuning array for maximum gain with no compromise to facilitate matching.

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Hy-Gain's Hi-Q traps result in minimum element loading and true FULL SIZE performance. Longest element of approx. 32' together with full sized 18' boom spacing results in a triband beam with full 8 db gain and 25 db F/B ratio.

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Streamlined traps (only 3"x2") together with steel boom construction result in smallest total wind loading area possible in a full sized tribander.

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Hot dipped galvanized steel boom 1½" in dia. for maximum strength with lowest possible wind loading. Boom braces form rigid angular boom/mast assembly. Heavily plated 10 Ga. steel channels attach all elements to boom and boom/mast with positive grip. Elements are 6061T6 high strength aluminum alloy. 1½", 1", ⅞" and ¾" sizes are used. All hardware galvanized and iridite treated.

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Top full-size performance in limited space with one transmission line on 10, 15 and 20M. Boom length 6'. Longest element 32'.

5.8 db gain 18 db F/B Ratio — **69.50**

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W1ZEN/1 . 472- 59- 8-A
W1AHE/1 468- 52- 9-B
W1PLX/1 . . 72- 18- 4-B
W1RCJ/1 . . . 15- 5- 3-B

E. Massachusetts

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K1CDN . . 1984-124-16-AB
W1J8M . . 1344-112-12-B
W1AQE . . 1232- 77-16-AB
W1HLF[1] . 1200-120-10-A
W1IKO . . 1044-116- 9-A
W1EZZ . . . 820- 82-10-A
W1BDF . . . 549- 61- 9-B
W4YHD/1 224- 28- 8-B
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W1KBN (4 oprs.) 1862- 98-19-AB
K1HVV (K1s DIR HVV) 570- 57-10-A
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W1LMZ/1 464- 58- 8-B
W1PHU . . . 140- 20- 7-AB
W1BRF/1 (10 oprs.) 2244-187-12-A

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K1DFU . . . 259- 37- 7-A

Vermont

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W1OAK[7] . . . 96- 16- 6-A
W1EXZ 72- 12- 6-A
K1CUS 27- 9- 3-A
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Oregon

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W7RGS/7 (W7s RGS SQQ, K7CKE) 132- 66- 2-A

Washington

K7AZC 54- 27- 2-A

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K6VXI . . .300- 60- 5-A
W6GQA . . .155- 31- 5-B
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W4VIW 24- 8- 3-A

Virginia

W4LTU . . .897- 69-13-B
K4RAY[1] . .756- 84- 9-A
W4YOP . . .680- 85- 8-A
K4SSA . . .396 66- 6-A
W4JCJ . . .340- 34-10-B
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K8CKU/8[2] (6 oprs.) 5975-231-25-ABC
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K4GQK . . .45- 15- 3-AB

Eastern Florida

W4RMU . .126- 18- 7-AB
K4PPX . . .23- 23- 1-A

Georgia

W4GIS . . .130- 26- 5-AB
W4FWH/4 114- 19- 6-AB
K5AWT/4 .112- 28- 4-A
K4KLD 52- 13- 4-A
K4MDF/4 . .24- 8- 3-B

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K6TBS . . .930-155- 6-AB
W6PUQ . . .612-153- 4-A
K6YSK . . .416-104- 4-A
W6PFE . . .200- 25- 8-AB
WV6ABZ . .183- 61- 3-B
K6OVF . . .156- 39- 4-B
W7QDJ/6 .145- 29- 5-AB
K6SHJ 105- 35- 3-B
K6TVO 87- 29- 3-B
W6BWG . . .27- 9- 3-A

(Continued on page 164)

TOWERS

ALL THE WAY - IT'S EZ WAY

See Page 112

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Dual Output (Simultaneous)	600 VDC @ 100MA 300 VDC @ 200MA

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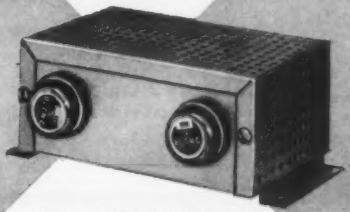

MODEL H-250 — CONTINUOUS DUTY OUTPUT: 18¼ Watts

Single Output	250VDC @ 65 MA
Dual Output (Simultaneous)	250VDC @ 32½MA 125VDC @ 65 MA

Kit, $33.95 **Factory-wired, $39.95**

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Single Output	300VDC @ 100MA
Dual Output (Simultaneous)	300VDC @ 50MA 150VDC @ 100MA

Kit, $42.95 **Factory-wired, $49.95**

MODEL H325 — CONTINUOUS DUTY OUTPUT: 48¾ Watts

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Single Output	375 VDC @ 200MA
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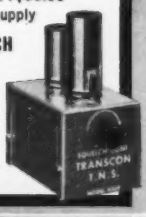

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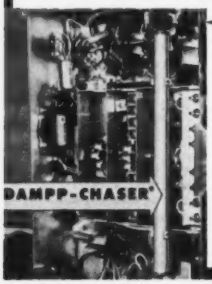

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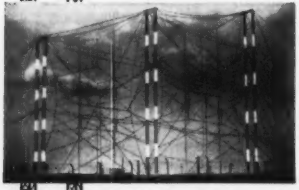

Designed, built and installed by Trylon, these two broadsides give 5% to 10% more reliable long-distance communications than comparable rhombics — and with a bandwidth of ±15% of center frequency at 1.5 VSWR.

WIND TURBINE COMPANY, West Chester, Pa.
In Canada: The Wind Turbine Company of Canada, Ltd., Toronto 9

Arizona

W7QLZ/7 . . 14- 7- 2-AB
W7VMP (5 oprs.) 476- 63- 7-ABCD

San Diego

K6COE/6 . 976-122- 8-AB
K6YLQ/6 . 436-109- 4-A
W6ZOP/6 . 153- 51- 3-A

Santa Barbara

W6UWL . . . 44- 11- 4-B
W6SDW/6 (5 oprs.) 3172-244-13-AB

WEST GULF DIVISION

Northern Texas

W5FEG . . . 250- 50- 5-AB
K5BLP . . . 114- 38- 3-A
K5RCZ 90- 33- 3-A
K5BDL 46- 46- 1-A
K5KVE 24- 24- 1-A
K5GHR 23- 23- 1-A
K5PDD 13- 13- 1-A
K5PCN 11- 11- 1-A
K5DCQ/5 . . . 8- 8- 1-A

Oklahoma

W5HFW 28- 14- 2-B
K5CAY 14- 7- 2-B

Southern Texas

W5LFM 38- 19- 2-A
K5PNV 28- 14- 2-A

CANADIAN DIVISION

Ontario

VE3BQN . 1664-119-13-ABC
VE3AIB . . 1230-114-10-ABC
VE3DSU . 1133-103-11-AB
VE3DIR . . 938- 67-14-B
VE3MR . . . 600- 65- 8-BC
VE3DUU . . 440- 88- 5-B
VE3BRO . . 192- 64- 3-B
VE3CWN . . 192- 64- 3-B
VE3BPB . . 175- 35- 5-B

Quebec

VE2NI 689- 52-13-ABC

[1] Technician Award Winner; [2] Multiple Operator Award Winner; [3] Novice Award Winner; [4] K2YRZ, opr.; [5] W2AUF, opr.; [6] Hq. Staff, not eligible for award; [7] W1FTF, opr.

How's DX?

(*Continued from page 76*)

construction and receiver refinements when not QRL with the DX pack on 10, 15 and 20 c.w." . . . . . OVARA indicates that ZD7s SB and SC ease the 14-Mc. c.w. pressure on hard-working ZD7SA . . . . . WGDXC informants find 15AAW concentrating Statesward around 1800–1900 GMT near 14,070 kc. The Gulf gang also hear that EAs 3CY and 9AW intended Ifni action last month, 20 c.w. preferred.

Oceania — YJ1DL summarizes goings-on in the Condominium: "YJ1AA's large family keeps him QRL. YJ1BS has a Harvey-Wells T-90 and NC-183 working home to Lawrence, Mass. YJ1LC, better known as FU8AE, puts a lively 100 watts on 14- and 21-Mc. c.w. with occasional switches to phone. Newcomer YJ1OM, Mac McCutcheon, a missionary, is quite active on 80 and 40 phone with 15 watts and is readying a DX-100. The call YJ1RJ has been granted to Ray Jenkins, an ex-GI radio repairman from California, who intends much Stateside QSOing from Espiritu Santo." Power-source troubles, water-supply shortages and fresh-food rarity nettle the YJ1/FU8 gang. YJ1DL's off-duty hours coincide with Santo's no-power periods, so Dave is QRT in the main. "Nobody using s.s.b. or v.h.f. out here yet. It's a struggle to get on the air at all." . . . . . VR6AC writes W8FEM that his usual Pitcairn pattern calls for 20-meter operation on Tuesdays, Wednesdays and Saturdays from 0530 to 0700 GMT with a rockbound 30 watts, 6-tube Eddystone and 50-foot-high Vee. Floyd figures to try more 15- and 10-meter shenanigans in the future . . . . . VKØs KT and TC finished their 12-month Macquarie vigil on the 15th of last month. W2SSC and others hope replacements for George and Tom will be DX-minded individuals . . . . . The unfortunate passing of KP6AK on Jarvis isle received wide currency in the daily press. WØBSK and KØHGB forward AP clippings which describe Otto's death from heart attack in early October while performing solitary IGY duties for Scripps Institute . . . . . Looking around after his return to Fiji from a world-wide vacation tour, VR2BC reports, "Some new faces among the VR2s — and some vacancies. Must catch up on things!" . . . . . JZØDA writes W8ZCQ of an air accident involving JZØs PA and PB wherein the latter perished. "Now only JZØHA and I are operating but more JZØs may be coming soon." W8ZCQ and his N.N.G. friend vote for more-meaningful QSOs and less mere report-exchanges and PSE-QSLs on DX bands . . . . . .

Hereabouts — Need South Dakota? Of interest to DX stations in particular is the February South Dakota DX Week End sponsored by WarWhoop, an organization of the state's net control operators. From 2300 GMT on the 13th of next month to 2300 on the 15th, South Dakota sharpshooters will be concentrated on the lower 25-kc. portion of each c.w. band and each phone subband, 10 through 80 meters. South Dakota Zeroes will indicate their state on CQs and will dig deep for weak "CQ South Dakota" pleas. These details come courtesy WØBLZ and ARRL Dakota Division Director WØPHR.

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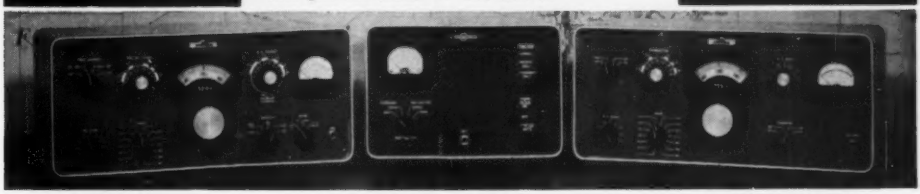

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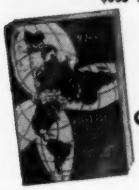
516F-2 Power Supply, 115 VAC, provides voltages to 32S-1 - $10.50 down; $6.30 per mo. - $105 net



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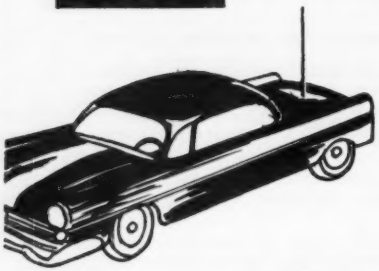

New normal mode helical antennas

Now — an efficient distributed-load antenna built into a Shakespeare Wonderod! You can mount this shortened antenna on trunk or fender . . . . where radiation pattern is best. Superior Shakespeare fiberglass construction, using high grade dielectric materials to reduce power loss.

Style	62-1	62-2	62-3	62-4	62-5	62-6	62-7
Band	30-35 mc	35-42 mc	10 meters	15 meters	20 meters	40 meters	80 meters
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*marked for intermediate frequencies.

Amateur net

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Box 5207, Columbia, S. C.

Subsidiary of the Shakespeare Co.

The World Above 50 Mc.

(*Continued from page 70*)

openings, and Arizona, Utah and Idaho (never heard via F_2 skip previously) are in almost daily. CT1CO has been logged as early as 0645 EST, and path to Europe is open daily for as long as 6½ hours, overlapping openings to West by several hours.

W1YOL, Hartford, Conn. — Anyone interested in promoting a transcontinental relay system on 50 Mc.? Believe messages could be handled almost anywhere in the country using 50-Mc. stations only, with present level of activity. DX is fine, but traffic handling and organized effort aimed at transcontinental relaying would be a fine means of building activity during dead-band conditions. Would be glad to hear from interested parties by letter or 6-meter message.

W1ZTT, Harwinton, Conn. — Operating on 220.05 Mc. each Tuesday at 2030 EST.

K2AZT, Baldwin, L. I. — Experiments with 420-Mc. modulated oscillator indicate that this approach to u.h.f. work is not worth the trouble.

W4FNR, Ft. Lauderdale, Fla. — Some years back signals could be heard on 50 Mc. only when band was open. Now local activity and QRM equal lower frequencies. Band open to Europe 12 of first 24 days of November. Worked OH, SM, LA, HB, VE7 and KH6.

W4FWH, Doraville, Ga. — Early October was best period for 2-meter DX ever experienced. Worked W2AMJ, W2AZL and W3TDF, and heard W1RJA in Oct. 7 opening.

K4KYL, Knoxville, Tenn. — Increasing interest in 220 Mc. in Knoxville area.

W6MEP, Northrup, Cal. — Los Angeles area 2-meter repeater station, K6MYK, now operating on 146.98 Mc. Receiving frequencies are 145.08 Mc., for the 246 Net and general rag-chewing, and 145.18 Mc. for the LA CD Radio System.

K6OKK, Vacaville, Cal. — Having good results with halo shown in September *QST*. Mobile range now up to 40 miles, with best DX worked under dead-band conditions 100 miles.

Have discone antenna designed for 150 to 1000 Mc. in operation. Am able to copy W6AJF, Sonoma, on 432 Mc. over 30-mile path.

W6OYM, Sherman Oaks, Cal. — Tremendous signals on 50 Mc., even from stations running very low power, demonstrate folly of low-edge crowding.

K8BYQ, Bellbrook, Ohio — Mobile 50-Mc. stations operated by W8NPE and K8s HCX ECF MDW and BYQ aided police in holding down Hallowe'en vandalism.

K9IQO, Milwaukie, Wis. — OBS schedule: Sunday, Wednesday and Friday, 1900 CST, 50.6 Mc.

KØIPD, Berkeley, Mo. — Something new in hidden transmitters was tried out by KØABA in one of the regularly-scheduled hunts of the Midwest V.H.F. Club of St. Louis. Bob was dressed as a woman, and the Communicator III, antenna and storage battery were housed in a baby carriage. KØABA/mobile operated in a four-block area for two hours before being challenged by the winner, WØTDS. Time had to be called for battery replacement at one point in the hunt. QST

Correspondence from Members

(*Continued from page 82*)

here what the O.T. told the "watcher." So, please tell me when and where to operate before I get that General and start modulating. — *Vince Amico, KN8LQM*

S. W. R.

100 Denmam Road
Cranford, N. J.

Editor, *QST:*

As a holder of a Restricted Radio Operator Permit I feel well qualified to bring to your attention that in the September 1958 issue of *QST* Magazine on page 58 it is quite dangerous for the man to stand on top of the multi-beam antenna mast erected by W1FX. I would also like to call to your attention that if a human being were to be made a permanent component of such an array that it would seriously effect the s.w.r. I am not sure, however, whether this would be detrimental to the signal or not? Please inform! — *G. Duncan Fletcher*

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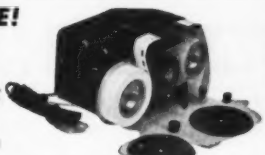

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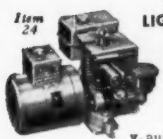

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9 db Forward Gain
Net wt.: 8 lbs.
Boom length: 9 ft.

This VHF Antenna is OPTIMUM SPACED for max. forward gain. Parasitic elements constructed from ¼" 6061T6 alloy aluminum rod for Hi-Q resulting in increased efficiency. Booms ¾" heavy wall al. tubing. Hardware hot dipped galv. Iridite treated. Extremely easy to assemble. May be stacked for add'l. gain. Complete instructions in manual. Pre-Calibrated Gamma Match with coaxially formed reactance cancelling capacitor built in makes pos. perfect 1:1 SWR. Coax connector for 52 ohm feed line.

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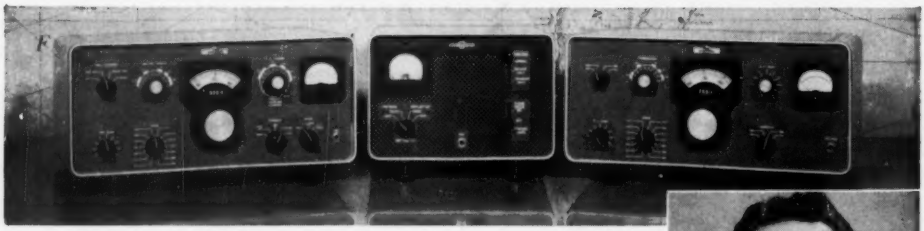

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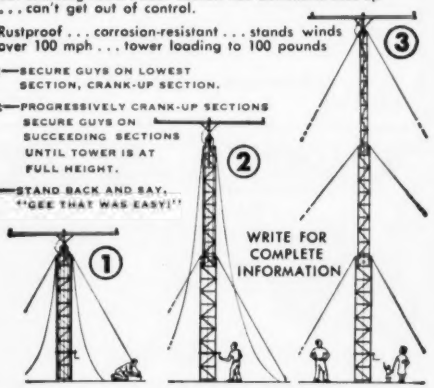
3—STAND BACK AND SAY, "GEE THAT WAS EASY!"



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- Matches either 52 or 72 ohm antennae.
- May be used as exciter to drive high powered transmitter.
- Tuned and air-tested, with crystal and tubes supplied—ready for operation.
- All models employ 12AX7 as speech amplifier/driver, and 2 6AQ5 tubes as CL A Modulators
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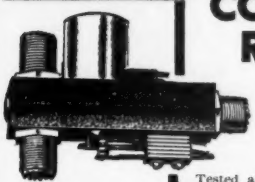

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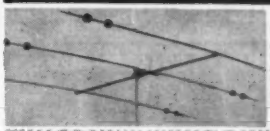

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TOWERS

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See Page 112

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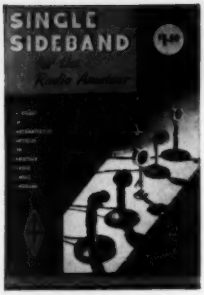

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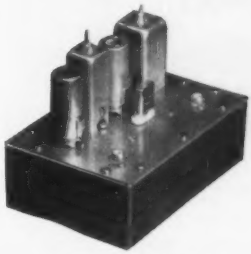

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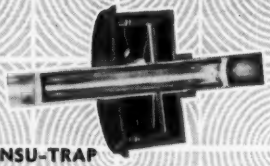

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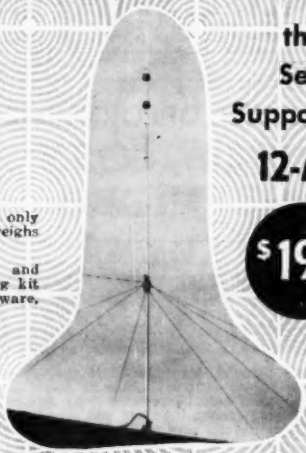

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WANTED: Factory-wired Central 20A or similar, linear. State condition, accessories and cash price. David Bell, 940 Northill Rd., Baltimore, 18, Md.

SELL Or trade Gonset Mobile Twins, complete with mike and Rafred all-band antenna. One year old, in exec. condx. N. K. Thompson, W1LWV, 99 Water St., Millinocket, Me

SELL: College forces sale of my DX-100 with push-to-talk, co-ax relay, etc. HQ-140-X with Heath Q-multiplier, both used only one year, in excellent condx. Also: Heath Grid Dipper, Vibroplex bug, *QST*'s 1949, 54–57 complete. Best offer takes one or all. Ross Harris, W1ARU, Kirkland B-24, Cambridge 38, Mass.

SELL 25 to 42 Mc. mobile transmitters, complete with tubes and dynamotor, $7.00 each. Receivers for same frequency, $27.50 each; 1–208 FM signal generator 19 to 45 Mc., $45. Ralph Villers, Box One, Steubenville, Ohio.

HAM TV Equipment. Bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

SPECIAL SALE: GPR-90, G8B-1, Speaker $425. Hammarlund SP400X $195, HRO-60, calibrator, speaker, Colls A, B, C, D, E, F, AA, AC, AD, $395. Johnson Five Hundred transmitter $525. Courier amplifier $210. 32V-1 $295. KWS-1 $1150. Gonset Communicator 2 meters 6 volts $129. Want: teletype printers, reperforators, perforators, BC-348, BC-221, BC-342 and other surplus in trade for new Johnson Valiant, Thunderbolt, National 303, HQ-170, Towers, Antennas, Rotators, Fisher Hi-Fi, Bell etc. Write Tom, W1AFN, Alltronics-Howard Co. Box 19, Boston, 1, Mass. Richmond 2-0048, Stores: 278 Friend St., Boston (near North Station) 60 Spring St., Newport, R. I.

FOR Sale: Viking KW amplifier, $1000; 75A3, $350. W. R. West, 830 West 21st St., Norfolk, Va.

HRO50T1, w/spkr, and coils. A, B, C, D, Teirad 18A standard, 1000 Kc, 100 Kc, ad 10 kc. Best offer cash or will consider smaller receiver as part trade. Michael J. Marshall, 455 Washington Ave., Dumont, N. J.

HAM Licenses, resident courses. Novice and General classes, 3 evenings weekly. Delehanty Institute, 117 East 11th St., New York City 3. Tel. GR 3-6900.

KWM-1 Wanted. Also few high plate dissipation tubes. K2KUW, 64 Crane Pl., Arlington, N. J

WANT: KWS-1; Sell 600-L, $330; 20A with 458VFO, 10 m. converter and QT-1, $180, 250w matchbox, $30; DB23, $20.00; all new condx, except DB23. W6QZD, P. O. Box 761, Menlo Park, Calif.

I am a member. Are you? W1ICJ

SALE: SX-17,560 Kc to 60 Mc. First $60 takes it. Hallicrafters receiver; 500 watt mod. xfrmr matches 805–810, etc., $15; Thordarson power xfrmr 3600 0 3600 at 1 amp, 2250 0 2250 at 750 Ma., like new, $30; 10 watt 75 meter mobile with 6 volt power supply, built by McGuire, $20, new condition; one Hammarlund BC-779B to 20 Mc. Very hot receiver, $115 with speaker. Ross Macaluso, 41 Birchwood Dr., North Arlington, N. J.

SELL: Tecraft 2-meter converter 26-30 Mc. i.f. $20. K&E log duplex decitrig slide rule 12" with leather case and magnifier $15. W1IKE c/o ARRL.

FOR Sale: Globe Chief and modulator, $50. Ed Horat, K9GTG, 1536 State St., Alton, Ill.

SALE: SCR522 and accessories, $23; 8C688A, BC689A and accessories, $27; BC645A, $19; prop pitch motor, $15; SX28, $110; DX-100, $180; Matchbox $50; Signal Sentry, $18; Heathkit AM2, $13; Bud LP filter, $17; 60 ft. telescoping tower, $115. 43" x 22" x 18" cabinets, $13's VT127A's xfrmrs, etc. M. R. Wahlert, 3674 176th Pl., Lansing, Ill.

FOR Sale: Viking I all TVI suppressed, modified running 200 watts in exc. condx, extra audio stage, etc; Viking VFO, B&W low pass filter, Hallicrafters SX28 recvr with speaker, 3-el. Telrex beam with rotator and CDR indicator, all in gud condx; Lettine xmtter 40 to 50 watts with Drake low pass filter and Lysco VFO and pwr supp, complete. Going to electronics school and have no time for ham radio for awhile. Need money also. Prefer local deal. W2KNG, Charlie, 68-16th Ave., Paterson, N. J. Phone LAmbert 3-1250 between 5 to 6 P.M.

KITS Assembled, wired and tested promptly. Our charge 20 % of kit price. Experienced with all makes ham equipment, test instruments and high fidelity. Partly wired kits same price. Finest checking equipment. Also equipment designed and built, factory standards workmanship. Have been sent direct to us. Surplus gear converted. (Licensed ham since 1924, Ex W9AXJ). Money back guarantee. K0KJN. L. P. Jackson, 645-A Marshall Ave., St. Louis 19, Mo.

WANTED: Ranger or Navigator, also Courier or Thunderbolt, factory w/t. no modifications. Also 8X101. I. N. Johnson, W0CPP, Luverne, Minn.

KILOWATT Fone: one enclosed rack has B&W all-band final, Thordarson Class B modulator, three heavy-duty power supplies and oscilloscope monitor. Complete with all tubes, meters, relays and controls. Requires only 75-watt exciter to operate. Professional appearance, in perf. condx. $225; pair Eimac 4–250A, new, $57.50; pair 250TH, new, $19.50; pair 813 used, $9.50; 3BP1, new, $1.50; T-17 mobile mike, $1.50; B&W coil turrets BCL, $5.95; BTEL, $4.95; BTCL, $4.95; Kilowatt power supp. complete, $29.95. Will trade. Want Hi-Fi loudspeaker and FM tuner. H. G. Price, W4LIL, 340 Ayr Hill Ave., Vienna, Va.

SALE: Viking Ranger $145. 10B with QT1, $100, both in excellent condition; 88–75s, as is, $50 each. Electronic Engineering Co., Wabash, Ind.

NATIONAL NC-83, rack & panel. No shipping. Local deal only: $110. W2JSM, 316 George St., Babylon, L. I., N. Y. Tel. MO 9-4452

DETROIT Hams! Thordarson True-Fidelity plate transformer. 3500 volts DC at 1000 Ma. ICAS. 115 volt-230 volt primary. Sell for fraction of original cost. This transformer never used. Weighs 160 lbs. A beauty. Matching filter choke. Several other fine transformer buys. See them at 16020 East Warren Ave., Detroit. Phone: TUxedo 4-4014

KIT Wiring. Write John Hodges, K4QHE, 724 10th Ave., Tuscaloosa, Ala.

KNOX Electronic Supply, Inc. "Where your Trade-In is always worth more!" 67 N. Cherry St., Galesburg, Ill.

TOWER-Alprodco pop-up, PM42 42 ft. complete with rotating guy-rings, extras, excellent condx, $50; two BC645s, new, $15 each. All f.o.b. Yuba City, Calif. W6WLI, Norm, 1304 Stafford Way.

FOR Sale: Knight 50-watt trans. and Novice band xtals. Used one year, $40. Carl Thoresen, K2HCD, Hilton, N. Y. Tel. EXport 2-3815.

FOR Sale: HRO60, 1 year old, in orig. carton, w/XCU-2 100/1000 Kc. xtal calibr, A, B, C, D coils in perf. condx, $400; Telrex R1008 rotator with direction indicating and control systems, 1 year old, $90. Model A Slicer, $30. Phil Greenspan, K2ZZG, Woods End Rd., Morris Plains, N. J.

SELL: BC348R, low band converted, 28/30 Mc., has coupled BC453 Q5er, controls phase i.f., 915 Kc. or 50 Kc. two power supplies, $65. R. A. Cohagen, 326 E. Southern, Bucyrus, Ohio.

FOR Sale: 518B, $175; 32V3, $450; both for $600; RCA 1000 watt mod. xfrmr with screen winding, $30; RK65 tubes, $7.50 each; 701A tubes, $4 each; 304TL, $5 each; 2–6580, $20 each; 450TH, $20; 2500 volt plate xfrmr, 400 mills, 110 or 220, $40; 866 fil. xfrmr, 10 m. volt insulation, $5. J. E. Shutt, W4JBN, Sturgis, Ky.

FOR Sale: Link 1908 150 Mc. 500-watt FM transmitter in gud condx, less cabinet, wonderful 2-meter rig, $150; will sell separate chassis final, $50, exciter, $35; low power supply, $30; high power supply, $65, meter panel, $25. Swaps invited. Need "B" SB slicer, Millen 90903 scope, Panadaptor. Also have TB850D with VFO and AC power supply, $100. Larry Arnold, K4AET.

FOR Sale: Used Johnson Match stick, no guy ropes, come and get it, $50 cash. W9EZN, 6647 Kenton, Lincolnwood, Ill.

SELL: Gonset Comm. I, new condx, $125. You pay shipping. Mike Stefanik, 3050 Edwin Ave., Ft. Lee, N. J.

COMPLETE File *QST*s, 1915–1951 for sale. Landa, Clayton 2, Georgia.

SALE: NC-300, NC-98, Harvey-Wells Z-match, like new, reasonable. Cliff Storch, 5 Winfield Terr., Great Neck, L. I., N. Y.

SELL: BC610D, TVI suppressed, all bands with external VFO, spare tubes; worked 200 countries. Will sacrifice for $250. Cash & carry deal only. W2BYP, 71 Tuttle Rd., Briarcliffe Manor, N. Y.

FOR Sale: KW-1 the best AM/CW xmitter around, lightly used; come and get it for $2150.00. with spare tubes. 51J3 with speaker, $650; Gonset Communicator II, C.D. 2M, $165. H. Langerman, W2LBJ, Harbor Acres, Port Washington, N. Y.

FOR Sale: Elmac PMR6 with Elmac supply in A-1 condx, $85 with manual. Clyde Williams, Leaksville, N. C.

WANTED: B & W HDVL coils. Please advise condition and price. W1BB, Stu Perry, 36 Pleasant, Winthrop, Mass.

SALE: HRO-W (same as HRO-5-T) ; DB-22A Preselector, excellent condx. Best offer. W2UYI.

DX-100 V.O.X., SWR Meter For Sale; Match box; NC-183D; all equip. like new. Reasonable. W2BAA, R. E. Ballner, 22–12 128th St., College Point 56, L. I., N. Y. Tel. FLushing 9-4009.

COMMUNICATOR III, 6 meters. Used 3 months in shack, only Will be glad to ship in original carton, $225. W3DCY, Nicktown, Pa. Phone Williams 8-6000.

SELL: S-51 Hallicrafters mod. with S-meter, $35; Knight signal tracer wired: $25; or both for $50; 10-meter FM xcvrs, incldg 2 xcvrs and 2 pwr packs, 1 mike 1 ant., $100. Richard Holtenga, K8GLG, Lake City, Mich.

FOR Sale: Viking II and VFO, used very little while in college; NC-125. Best offer. A real bargain! Jeffrey McKenzie, 1279 Yale Station, New Haven, Conn.

20A, latest model 88B exciter in factory carton, complete with QT-1 and 458 VFO. Buying Collins S line. $175 F.o.b. W3IGI, 67 Pumpkin Hill Road, Levittown, Penna.

WANTED: Regency transistorized converter, Mod. ATC-1. State price, condition, etc. K2CI, T. Donchue, 72 S. Clinton Ave., Bay Shore, L. I., N. Y.

SIX Meter station for sale: Complete! Hammarlund HQ-110C matching clock, timer and speaker. Lettine 242, 45-watt xmtr, Lettine matching VFO, Alliance rotator with direction indicating control 3-el. beam, mast and cable. Calrad 500C Studio mike, Shure 707A mike, Dow-Key relay. Now here this: All equipment is in immaculate condx, not a scratch to be found anywhere. Take it away for $325. Will sell as a complete station. I prefer not to ship, but willing to deliver within 100 miles of NYC. Noel Finerman, W2SDI, 36–06 30th St. Astoria 6, L. I., N. Y. Tel. STillwell 6-1725.

FOR Sale: All equipment, including 304TLs, 813s, 811s, RCA KW mod. xfrmr, KW plate xfrmr, fil. xfrmrs, BC610 tank condenser and coils, cabinets, chokes, sockets, misc. pwr supplies and xfrmrs. Much of the above has never been used! Also have *QST*s from 1932 through 1941. Cannot ship. You have to pick up lot for $75. Inspection by appointment. Call Mrs. Mina Bullock, Phone 3886 JR, Mount Vernon, Illinois

HALLICRAFTERS, Drake, Central Electronics, Gonset, Ham gear, Jerry W8EPI. Swartzlander Radio Limited, 1220 Stilwell Avenue, Fremont, Ohio.

WANTED, 388 or 51J communications receiver. W1KWB.

SCR-522 XMITTER with original automatic tuning, meter, mic. V-R power supply (300, 24, 0–150 vdc & 12 vac) in 36" enclosed relay rack. Perfect! National NC 2–40D receiver & speaker and RME VHF-152A 10, 6 & 2 meter converter — both like new. Unmodified BC-459A 7–9.1 mc. xmitter. Make offer. B. P. Bridge, 7432 Devon St., Phila. 19, Pa.

ELDICO Electronic Key and Telerex 10–15–20 meter beams. Craig, 1653 Taylor Ave., Racine, Wis.

YMCA radio club needs complete station. Would appreciate any equipment which you care to donate. Write or send equipment to W3SIW, South Community YMCA, P6H 36, Pa.

RME 4350 dual conversion, brand new condx. Sells for $230 new. Would like $180 for it. Bruce Hobson, 1902 Asylum Ave., W. Springfield, Conn.

SALE: Adventurer, HQ140X, Heath Reeflcted Power Meter, Dowkey 110VAC coax relay, Dowkey 12v coax relay, Lysco 382 VFO, 100-watt moduator, Elmac PSR6–12, Johnson Lo-Pass Filter, Also many small items. Write for list. Make offer for any or all items, Eldon Staleup, 423 Kenmore, Evansville, Indiana.

GONSET Tri-Bander, two element beam, latest model in factory sealed carton, $69.50; MOSELY MOBILE tri-bander, brand new in factory carton, $17.50, quickoff connector free. W5DZ, P. O. Box 1009, Waco, Texas.

FOR Sale, Johnson 6N2, used little, $125. National 2-meter converter with national cabinet, $50; Heathkit CT-1, $5; Heathkit VP-1-6, never used, $4. Make offer on an SBP4, TV tube. W3YPL, 104 Johns Ave., Gettysburg, Pa.

IMMACULATE NC-300, speaker, $300; DX-35 and VF-1, $50; Heathkit Conelrad Alarm, $10; Heath C-3 Condenser Checker, $15. Send for list. Joe Morgan, Lovington, Illinois

SELL: One crystal calibrator for National NC-300, excellent condx and ready to plug in. $10.00. W8BBA, 502 Six Street, Fairport Harbor, Ohio.

75A4 Ser. 5030 500 cyc. filter KWS-1, perf., used very little. Combination price, $1800. M. Marsley, 2242 Stevens Ave., Kalamazoo, Mich. Phone F-14815Z.

KWM-1 with Collins AC supply, console. In perfect condition, recent serial, and priced at dealer cost of $820.00 complete. W5NDF, Box 508, San Angelo, Texas.

COLLINS 75A4 latest model, 4 months old, $590. Johnson Pacemaker factory wired, 10 months old, $418. Beautiful condition and operation. Original cartons. W2HQH, 644 Wildwood Rd., W. Hempstead, New York. IVanhoe 1-1875.

SELL: DX-100 with Bud low Pass and Shure 777s mike, $200; SX-96 with R-46B spkr, $200; Works, $385. Delivery within 200 miles. Ed McDaniel, W9LLN, Rock Falls, Ill.

FOR Sale: New SX 101 Mark 3, used about ten hours, $325. W. C. Wallace, W6ASC, 12025 4th Ave., Lynwood, Calif.

SELL: AT-1 & AC-1, $38.33. James Byers, 391 Florida, Buffalo 8, N. Y.

SELL: Like new — Heathkit antenna coupler model AC-1 and Johnson Signal Sentry, each, $9.00. W. H. Rau, WØNUI, Henderson, Minn.

VALIANT factory-wired, 37 hours logged. $325, F.o.b. KØHLF, Odebolt, Iowa.

SELL: Best offer Elmac AF-67, Super 6, 75M mobile antenna, DX-20, HQ100C, 115V coax relay, 12V dynamotors, 12V vibropack, Johnson T/R, meters, Heath grid dipper, antennascope, phone patch, 10M beam, slip up mast, LM freq. meter, K & E slide rule. Cash only, no trades. Will ship. K4DUZ, 433 Farragut Circle, Virginia Beach, Va.

BARGAINS, New Guarantee: 90651 GDO, $39.50; Rotobrake, $49.50; Leece-Neville 6 volt, $35.00; Panadaptor 2T-200, $49.50; S-W Mobileciver, $59.00; P-H LA400 linear, $115.00; NC-240D, $139.00; P400GG linear, $199.00; BC610 with tuner, $495.00; Lfieuco 77 SSB, $399.00; Lfieuco PA400 linear, $99.00; KWM-1, $650.00; BC221, $49.50. James C1470 power supply, $49.50; DX35, $55.00; QF-1, $9.95; Scout 680, $89.00; LA-1 linear, $89.95; SM-90 modulator, $9.95; NC183D, $319.00; NC300, $299.00; King 500, $425.00; S&W 518B, $189.00; Johnson KW with desk, $1,150.00; HT-30 SSB, $339.00; HT-31 linear, $289.00; test and audio equipment, inquire. Trial, Terms, Write Leo, WØGFQ, Box 811, World Radio Laboratories, Council Bluffs, Iowa.

HRO-60-AC 21mc coil, $20.00. Misc. Riders Receiver Manuals, any, $5.00. All items F.o.b., guaranteed new. Wanted: F455J-31 filter, W2DXI.

FILTER capacitors, pyramid 4MFD — 2,500VDC, $5.50. G.E. Pyranol 2MFD — 4,000VDC, $8.00. Prepaid in original cartons. K4QPN, 214 S.E. First St., Eau Gallie, Fla.

FOR Sale: HQ140XA with calibrator and Central Electronics slicer, like new, $210. No shipping. S. Rand, 27 Forest Ave., Ossining, N. Y.

SELL locally: Globe Scout 65A, Homebrew xmtr 809's, 120w., A1 & A3, 807 in osc. — VFO, all bands, 4 chassis in five foot rack. What am I offered? Will heckle. Also xtal mike, 10" speaker in portable case, printed circuit repair kit plus many other things. Need money for college. Joe Blasi, Box 26, Bishop Hall, Seton Hall U., S. Orange, N. J.

WANTED: DPDT antenna relays, wide spaced HV/RF insulated contacts, old type open wire 600 ohm feed lines — W1BB.

NATIONAL 183 rack and panel speaker. W2JSM, 316 George St., West Islip, L. I., N. Y. Tel. MO 9-4452. $100.00.

POSTCARD brings nice Bargain List! Box 575, New York 8, N. Y.

COAXIAL Cable. New surplus. RG-54A/U, 58 ohms impedance — 50 ft. prepaid, $1.00. R. Farmer, 3009 No. Columbia, Plainview, Texas.

SELL: Custom mobile transmitter-receiver combination for all bands (80 through 6 Mtrs.) complete with dual vibrator supply, an A.C. supply with built-in speaker, and an all band remote antenna with mount. Unit measures 4½ x 14 x 8. Receiver — 0.3 microvolt sensitivity, dual conversion, squelch, "S" meter, ANL, crystal controlled on one channel. Transmitter — 60 watts input, pi-network, metered, VFO, one crystal position. Antenna — motor driven with indicator for base loaded whip. $250. W8GBT, 118 Cambridge, Pleasant Ridge, Michigan.

FOR Sale: Mosley VP 10-20 beam, 6 elements, 3 on ten, 3 on twenty. High gain 10, 15, 20 & 40 trapped vertical. CDR AR-22 rotor. 40 foot steel crank-up tower. Items in excellent shape; all for $165.00. K6MZE, 2624 Sarda Way, Rancho Cordova, Calif.

SELL: Like new Collins 75A4, $495; Johnson Pacemaker, $358; WRL Tri-band beam, $48. H. Zirjacks, Post Signal Office, Ft. Polk, Louisiana.

FOR Sale or Trade: Hy-gain 18AV Vertical with mount and instructions. K5OMQ, Walter Gill, Box 725, Roswell, N. M.

COMPLETE Station. Globe King 400B, Collins 310-B-1 exciter, SX-100 Receiver. All for $500 or best offer on individual units. 2-Volaline 465 Mc. transceivers model 425. Make offer. All equipment like new condx. WØNKL, 1226 Penn., Kansas City, Kans.

HALLICRAFTERS SX-71 for sale: excl. cond., $150 delivered in Bay area. Gould, 2144 Manzanita, Menlo Park, Calif.

TRADE or SELL: Crosby 67B SSB slicer, $90; #3296 Triplett Modulation Monitor, $50; Triplett 421-A illuminated panel meters 0–50, 0–300, 0–500 DC ma and 0–8 AC volts, $5 each; National TMA-50DA, $5; B & W model 650 Matchmaster, $30; B & W 20HDVL and 40HDL coils $4 each; all items like new in original cartons. Consider trading for receiver — any size. W5CI, M. B. Patterson, Rt. 7, Box 347, Dallas, Texas.

FOR Sale: Hallicrafters SR-500 Console. Includes SX-100 Receiver, HT-30 Exciter, HT-31 Power Amplifier in console cabinet. Like new — used 5 hours, $900. G. A. Buchanan, M.D., W7EVK, 440 Circle Drive, Richfield, Utah.

FOR Sale: 32V2, $300. HRO-7 Receiver, $100. Will not ship. W2-DWH, Wantagh, L. I., N. Y. Telephone Sunset 1-1071.

NOVICE, Mobile, CAP: TBS50C, $50; Gonset Deluxe Triband, $20; PE103, $15; Mastermount 10M whip, $5; 30W Stancor Xmtr, $25; Heath AR-2 Rcvr, $20; 500W Universal Antenna Tuner, $25; Sparx Signal Tracer, $15; Radio magazines and Tubes from 1928. Robert Klugman, 146 Arlington St., Brighton, Mass.

DX-100: Professionally wired — gave up hamming one year ago. $185 including shipping. Donald Wilson, Poughkeepsie, N. Y.

NATIONAL CRM one-inch scope, $10; National 20 to 200 volt DC power pack continuously variable, $10; Pilot FM tuner, $15; Grid dipper self-contained power, $10; Heath VFO, $15; Mallory vibrapack 6/200 volts 100 ma., $8. W6EBY, 789 Garland Dr., Palo Alto, Calif.

FOR Sale: Complete Station: DX100 perfect condition, S40B receiver, Mosley 5-band trap vertical antenna, Heath Q Multiplier, Heath S.W.R. meter. Best offer over $250 takes it or swap for good mobile station. Mel Ornstein, 57 St. Pauls Pl., Brooklyn, New York. Telephone BU-26331.

EMPLOYMENT forces sale year old complete SSB station: 20A, VFO, QT-1, $190; 837 g.g. linear, $40; SX-100, speaker, $190; D-104C, stand, $14; Dow Co-ax relay, $5; Drake low-pass filter, $5; Unused 10 meter 3-element wide-spaced beam, $15, K2QBH, 51 Marion St., Carteret, N. J.

FOR Sale: Kool KW Amplifier, *QST* June 56 with 4–400s; 500 watt Multiband VFO Transmitter, *QST* Jan. 54; Variac controlled 0–3000 VDC at 1.3 amp.; Power Supply with 120μfd 3000V Output Condensor; 600 watt AM Modulator; 6½ foot Bud Delux Relay Rack; 5½ foot Premier Rack. Write Paul Powell, 500 W. 3rd, Borger, Texas.

DX-100, $150; NC-300, Xtal calib. & Spkr, $250. Both for $350. F.o.b., Tacoma, Washington. W7HMS.

PACEMAKER like new with Kilowatt grounded grid linear amplifier including power supply, $350. GPR-90 with calibrator, speaker and GSB-1 sideband adaptor, $450. All for $750 F.o.b. WØQFZ, 2318 Second Ave., Council Bluffs, Iowa.

CANADIANS: Opportunity knocks but once — Globe Scout new model 680A, seldom used, five months old, not a scratch, $100. Meisnner signal shifter with coils, $15; Lettine 240A, with 80 meter coil as it is, $35; Heathkit antenna coupler, $10. A. Robillard, 90 1st Street, Iberville, Que.

WANTED: KWS-1 this area. SELL: Meisner 150-B .250 watt AM-CW transmitter, pi-network output, $150. W2VIA, Bernard Fein, 80 Garden Rd., Scarsdale, N. Y.

SPORTS cars have won — Like new including plugs, cables, and manuals, a Harvey-Wells T90 Transmitter, $120 and Gonset G66 Receiver with matching Gonset 3 Way Power Supply, $145. Was a standby rig and never used mobile. No trades. Lawrence Hess, 173 West Chestnut Street, Kingston, New York.

MILLEN 90801 Xmtr. 90W, 90831 Matching Modulator. Both never used. Separately or together. Info on request. R. Weeden, W2IKF, Box 40, School St., RD 2, Nixon, N. J.

JOHNSON 6N2, excellent, $120. Want: 6v. Gonset noise clipper, W7VMO.

SELL HQ129x. Very good condition, $129. M. Kunzman, 723 Hillside Ave., Plainfield, N. J

LATE Ranger. Immaculate. Will accept first $165. Ship collect. K2LUE, TW 7-1292.

FOR SALE: 100 watt linear with power supply, tubes & coils, $25; two 100 foot rolls new RG8/u, $4.50 ea.; UTC filament transformers S57 new, $3, S60, $4.50; new vibrator transformers Stancor P4063, $4, P6131, $5; Stancor PC8414, $6.50; driver Transformer T20D77, $1.50; chokes new 15hy 150ma., $2, three 20hy 40ma., $1 ea.; scope transformer 4300V @ 3 ma. with low ℄ filament, $3.50; 10μf 600VDC oil cond, $1 ea.; Charles Copp, W2ZSD, 3 West Drive, Port Washington, N. Y.

COLLINS 75A4, #5500 series brand new condition, used less than 10 hours. 2.1 Kc. filter in addition to standard 3.2 Kc., vernier dial, original cartons, $600 complete or $550 less 2.1 Kc. filter. Hallicrafter HT-32, Serial #197,185, perfect condition, original carton, $540. You pay shipping. Johnson TR switch, $25. K7EPD, 3850 East Elm St., Phoenix, Arizona. CRestwood 9-2824.

SELL: Excellent BC-453, $10. Set 85KC IF-BFO's, $3. W7ZFB/9, 7 Penn Court, Urbana, Ill.

CLEARING out extra gear all new & factory wired. Bw 5100, $375; Collins 310, no TVI, $150; Ranger, $170; Nc 300 with speaker, $275; SX 101 with speaker, $275; Thunderbolt brand new, $500; Gonset beam new #3220, $75. Bill Brown, WØSYK, 28 Marine Ave., Box 756, Route #1, Maryland Heights, Mo.

DX-100, SX-25. Heath VOX, excellent condx., $289. Ben Botbal, 18 Mahanton Ave., Milton, Mass. CU 6-6587.

SAVE time & money. Build your rig with our customized prepunched chassis & panels. Advise specifications or we will help you plan it. Electronic Chassis Company, Box 1225, Boston 4, Mass.

KILOWATT variable condensers, 300 μμf, $14.95. Don Hinckey Mfg., Rutland, Vermont.

USED Bargains: Central Electronics 20A perfect, $200; Viking I TVI suppressed, $135, with new 4D32, $150; Viking Mobile, $75, with VFO, $95; Navigator, $135; Matchbox 300 watt, $35; HQ-100C, $140, with BFO, $150; NC-109, $139.50; PMR7 Elmac with P8R117, $145; Need trade Rangers, Valiants, DX-100, 20A, 10# etc. Write W9IHZ for used list, trade-in quote and easy terms. Brown Electronics, Inc., 1032 Broadway, Fort Wayne, Indiana.

SELLING Teirex Tri-band beam, $59; Mosley VPA-40-2 40 meter beam, $39; Drake phone patch, $19. Also HT33 SSB kilowatt linear amplifier with spare rectifiers and T Pad for perfect match with HT32 or similar exciter, $495. Will deliver in New York City and suburbs. K2CJN, Westbury, Long Island. EDgewood 3-3845.

ALUMINUM for every Ham need. Write to Dick's, Cherry Avenue, Route 1, Tiffin, Ohio for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

IN January as throughout the year, it pays to deal with Burghardt. We offer the following values this month: B & W 1000A Linear, $395; Central Electronics 10B, $119; 20A, $199; 600L Linear, $325; Eldico 88B-100A, $395; 88B-1000A Linear, $425; Elmac PMR-6A, $59; PMR-7A, $119; Gonset Communicator II 6 meters, $135; Communicator III 2 meters, $189; Johnson 6N2, $129; Ranger, $195; Navigator, $139; Valiant, $349; Viking II, $199; 122 VFO, $35; Globe Chief 90, $55; 90A, $60; 680, $89; 400C, $239; $219. Write for our new catalog No. 758. Burghardt Radio Supply, Inc., Box 746, Watertown, South Dakota.

TRADE: Have 100W. multiband xmtr. factory built, excellent, and Heath VFO. Want Gonset Communicator. Inquire. We can make a deal. Richard Light, K2UOY, 640 Riverside Drive, New York City.

FOR Sale: Globe Chief 90A, $50; NC 88, $85. Ship collect. Wanted: DX100. Dan Pierce, 1030 Avenue S, Kearney, Nebr.

HEATHKIT AR-2. Excellent condition with cabinet, $18. James Ward, K7CME, 24D Spruce, Mountain Home AFB, Idaho

FOR Sale: 2 Meter Gonset Linear Amplifier, good as new, $70; 150 watts input. Call or write after 5 P.M. John Ressegiue, 209 Prospect Pl., Brooklyn 38, N. Y. ST 3-2264.

BRUCE (N. L.) W7HRF (?). Please get in touch with "TX", W5GTL, 3220 Ethel, Waco, Texas.

VIKING I, TVI suppressed, Viking VFO, Bud Low Pass filter, spare final tube, Dow coax antenna relay, xtal mike, all in good condition, $195. W9RVX, Charles Belensky, 18 Metropolitan, Waukegan, Ill.

DX-100 top condition, $185; HQ-129X with "Q" Multi, $115; or best offer for both. W9YWF, 911 W. Mishawaka Ave., Mishawaka, Indiana.

SELL: Johnson Viking II with Heathkit V.F.O., $200. W2LPC, 51 Elmira St., Hicksville, L. I., N. Y.

SELL: 3 el. 10 meter beam, $20, 15 meter rotary dipole, $8. K2DZU, 1204 Stewart Ave., Bethpage, L. I., N. Y.

KILOWATT Transmitter in 6 foot rack cabinet with extra power supply built in for external exciter; final amplifier incompiete but I have most components. Need cash for college, best offer over $125. Polaroid 95B camera with model 200 flash attachment, $75. K1GJB, 44 Autumn St., Bridgeport, Conn.

NOVICES: 45 watt home brew xmtr., new 807 tube and pwr supply included. Highest offer above $32 plus postage & handling charges. KØQKY, 2220 S. Broadview, Wichita, Kansas.

SELL: DX100 with Heath approved keying — Excellent condition, complete new set tubes, has worked 146 countries, $180. Heath Grid Dipper $18, BC 779-B Receiver, good condition W/PS and instruction book, $120. Several new command sets $7. each. W3KA, 10406 Insley, Silver Springs, Maryland.

SAVE time, Save money! DX QSL's forwarded. 2¢ each after membership. Free flyer. "DX QSL Co-op," Box 5938, Kansas City 11, Mo.

SELL: BC-224-D (same as BC-348), $60. Excellent condition. Heath AR-3 without cabinet, $20; 50 watt home brew xmttr, identical to Adventurer, with matching VFO and power supplies for both, $60, both professional looking. Everything in exc. condx. W2PYQ, 28 Woodoak Dr., Westbury, N. Y. Tel ED 4-4991.

WANTED: 75A3, state condition and price. Sell DX-35 with 6-meters added, also antenna relay, $65. Excellent BC-342N with 6-meter converter, $65; RAX-2, $15. K6SVL, 5525 Paseo de Pablo, Torrance, Calif.

GLOBE KING 500C. Guaranteed perfect condition. Pick up and try out at QTH. Best offer over $500. Joe Krantz, Box 261, Charleston, W. Va.

WANTED: RME Mod. LF90 Converter, 90–600 kc. Advise price & condx. W1KJG, Box 295, Morrisville, Vt

ARC-5 Receivers, BC-453, $10.; BC-454, $8.; BC-455, $8.; transmitters, BC-457, BC-458, BC-459, $6.50 each.; mounts with plugs, single, $2.50, dual, $3.; triple, $3.50; MD-7/ARC-5 modulators, $3.50; control box, $1.50; T-23/ARC two meter transmitter, $14.; Collins ART-13 transmitter, perfect condition, unmodified, $95., or trade for receiver. APN-1 420 mc. transceiver, $9.50; BC-625 two-meter transmitter, $20.; ART-13 modulation transformer, with matching driver, $10. Tubes: Brand new 4-125A, $12.50, 4-400A, $36., 829B, $6.50, 4E27, $6.50, HK-54, $4.50; Jennings vacuum variable, 20 to 700 mfd. complete, $40.; 866A filament transformer, $4. Send for list. Bill Slep, W4FHY, Box 178, Ellenton Florida.

CRYSTALS, Airmailed. Individually boxed new crystals. Novice, net, general, FT-243 custom finished to .01%. Any kilocycle, 3500 to 8700, 99¢. Same range in small hermetic holders, .050" or .093" pins, $1.85. Airmailing 8¢ per crystal. Write for additional frequencies and brochure. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

HAM ticket, membership cards, etc., laminated in clear vinylite, $1., three for $2. John Price, K5RKF, Box 411, Paris, Texas.

INSTROGRAPH with oscillator & 10 tapes, $20; Viking II, f'ety wired, $169; Central Electronic 10B with QT & 40&80 meter coils, $119; Millen 90801 67 watt transmitter, $47; 6 meter Texas xtals, 72¢; CTC L83 coil forms, 4 for $1; HRO-60, $390; HQ-100 with clock, $147; HQ-120, $119; HQ-150, $239; speakers for NC125, $9; HRO60, $12; HQ150, $12; SX100, $7; Hammarlund rack speaker panel, $2. All guaranteed like new condition, F.O.B. Chicago 35, Treger, W9IVJ, 2023 N. Harlem Ave.

AUCTION: Ft. Lauderdale, Fla., Saturday, Feb. 14. Details here next issue

HEATH DX-100, excint condition. Has been rack mounted so cabinet is still new. Has built in Lynmar TR switch and two spare 6146's. Will ship collect. $195. Bob George, W8PIC, 1418 E. Bayview Trail, Petoskey, Michigan. Phone DI 7-2240

FOR Sale: Heath AT-1 with built-in plate modulator, good shape, will ship: $25. K2SNX, 818 New England Dr., Westfield, N. J.

WANTED: Old B.C. receivers prior to 1929. Send description and prices. WØGUX, Everett Hollstadt, 3957 Minnehaha Ave., Minneapolis 6, Minn.

DISC Tuning and neutralizing capacitors, and heat radiating plate caps: any size. W4UCH, Richardson, Sterling, Va.

FOR Sale: HQ-160 receiver and Viking Ranger transmitter, both new, $550 plus shipping. Thomas Gavan, 225 W. Broadway, Long Beach, L. I., N. Y. General 1-4008.

QUIT farmin', now hammin'. Will trade Gravely 5 hp. tractor, sickle, plow, cultivator, saw & cart for rig. Whatcha got? Bob Kleinhen, K8EAJ, Fostoria, O.

SELL: NC-98, $98. Globe Scout 65-B, $75. Both, $170. W5AAU/4, 198 Jackson, Titusville, Fla.

SELL: Collins 75A4 receiver. Like new, three filters, vernier tuning knob, matching speaker, serial No. above 2500, $695. Collins 32V3 transmitter, excellent condition, new PTO recalibrated, $495. W1RK 271 North Avenue, New Rochelle, N. Y. N. E. 3-7012.

CRYSTALS, meters, transformers, tubes; wide selection, reasonable. Free catalog. Rigor Products, Box 81, Rego Park 74, N. Y.

WANTED: Ranger, present model, factory wired, perfect. W1DY.

DETROIT Area Hams — Moving to East. Must sell 3 bedroom Trilevel home with 75 foot self-supporting galvanized steel tower already erected. Let your family enjoy lake privileges on Long Lake while you enjoy your hobby. Call W8PFU. Empire 3-4604.

BRAND new, never been on air, KW8-1, $1695, and WRL 500B (late model), $595; New, Morrow RT8-6008, $115, PE-103, $25, and Jones Micro Match, $32. Almost new 75A4, deluxe speaker, $615 (used only few hours SWLing); perfect MB-560, $185, and MBR-5, with 12v. sply, $205 (used only short time) like new. Pair TBY's with 4v. bat. and vib. sply, mike and phone, @ $28; New 115v. supplies for same, @ $18; Paleo 12v. vib., 600v., 225 ma., $40; Eico 5" scope #425, almost new, $45; CDR Rotator, TR-2, $18. Louis J. Kocurek, Jr., W5VIV, 442 Canterbury Hill, San Antonio, Texas.

SELLING: SX-100, SX-25, Drake 52 ohm low pass filter, Gardiner automatic code sender, BC-221, Precise oscilloscope Model 315, C-D capacitor decade 1–10 MFD, 300 watt CW transmitter and other items. Joseph Marshall, Jr., 22 Clare Drive, East Northport, L. I., New York.

GONSET Communicator III, excellent condition. Best offer over $200. F.o.b. W8VYI, Warren Groves, 3728 Crede Drive, Charleston, W. Va.

FOR Sale: Factory wired Johnson mobile, like new; Gonset super six; DM35 power supply. All 12V, $150. SX-100, used only few hours, $230. John Chooljian, K2KRF, Union 7-1850.

FOR Sale: HRO5 coil G and coil JB, $8.50 each. Heath Sweet generator, $29. Antenna tuner as per November, 1958, *QST*, $19. Don Maxwell, 110 Fayette St., Charleston, West Va

ONE or more of the following new tubes for sale or trade: 813, 811A, 829B, 4-65A, 304TL, 3B24, 3B28, 3C24, 3D21A, 3C45, 2C43, 2C39A, 2K25, 6B46. Jim Stroman, W5DHK/5, Rt. 1, Lometa, Texas.

FOR Sale: Mackay 167BY transmitter less power; BC654A transceiver; 19 Mark II transceiver; 3 PE103's; 2 Gn45B hand generators; GB5S surplus vertical antenna; Carter genemotor new; tubes 250th, 203A, 1616, complete modulator. Make offer. R. J. Kearney, 509 College Ave., Storm Lake, Iowa.

MOBILE: AF-67, M-1407 supply, Gonset Super 12 and noise clipper, Shure Mobile Mike, mounting racks, all plugs, cables, Master all-bander coil, whip, mount. All equipment perfect, two months old, now installed, no holes, scratches, original cartons, guarantee cards, manuals. Cost $384, sell complete $275 for quick sale. Smith, 1720 Holmes, Kansas City, Missouri

SELL the following equipment, all in excellent condition: 120w modulator, complete except HV, with multimatch xformer, $20; remote VFO and Bandbox as per handbook, very neat, $20; Johnson 500 HCS coils, 80, 40, 20, with jack bar and 2 links, $6; Johnson 100ED30 condenser, $3; 2 RCA 811A, new, $2.50 ea.; 2 Stancor xformers, 6.3 VCT6A, $2 ea.; UTC xformer, 847 3000 VCT 300 ma., $15; UTC choke S34 300 ma., $5; Merit fil. xformer, 2.5 VCT 10A, 7500v ins., $2; Advance 300 ohm antenna relay, $2; 2 C-D oil condensers, 6 mfd 2000v, $2.50 ea.; 2 G-E 1 mfd 2000v, 75¢ ea.; 3 RCA 837, new, 75¢. W3QOU, A. B. Johnson, 15 S. Old Oak Dr., Beaver Falls, Pa.

HALLICRAFTERS S53A, $60 — with Heath QF-1, $10. Heath DX-35, $45. Johnson Signal Sentry, $10. All used less than 1 year and in new condition. R. Lindgren, 344 Holley St., Brockport, N. Y.

FOR Sale: RME 4300 receiver like new condition. Original carton, $125. RME 152A VHF converter excellent condition, $45. W. Soules, R.R. 2, Box 291, Buchanan, Michigan.

SELL: Heathkit VFO 1500, BC348N receiver with AC power supply, $40, 15 meter converter, $5, JT30 crystal microphone, $5, Radiart 454 mobile power supply, $25, Zephyr Bug, $8. David Matson, 33 Linden St., Arlington, Mass.

NATIONAL NC-125, matching speaker, mint. condition, $135. Amphenol 139-040 antennas, new, $5; Astatic AT-1 booster-converter, $12; RCA 5HP4 CRT, new, $3. Edward Gamret, 28-D Longfellow Dr., Homestead, Penna.

FOR Sale: Viking I — 4D32 final (completely shielded and filtered for TVI), with Viking VFO. Transmitter has higain audio, push to talk circuit with extra front panel audio plate meter installed, $150; advance coaxial relay type CE/1C 2C/115v, $12; Astatic 104 mike with Gripto talk stand, $25; B & W low pass filter for above, $20; above sold as complete package, $185; brand new 4D32 spare tube for above, $20. W9PFW, Jack Koehne, 1220 Westview, Glenview, Ill.

BARGAINS: Reconditioned & guaranteed. 32V-2, $349; 32V-3, $495; B & W 5100, $299; Viking I, $145; Ranger, $199.50; HQ-129X, $159; HQ-140XA, $199.95; HQ-100C, $159.50; HQ-110C, $215; SX-96, $199; NC-300, $319.50; NC-125, $139; NC-173, $139.50; NC-109 w/calibrator, $179.95. Write for complete list. We trade. Complete stock of new gear. Terms with only 10% down. Write Ken, WØZCN or Glen, WØZKD for deal. Ken-Els Radio Supply Co., 428 Central Ave., Fort Dodge, Iowa.

BABY'S operation has priority. Forced to accept any offer, never uncrated W3DZZ full beam, unused AR-22 rotator, Rotobrake, cables. Cost $330. W2WLR, George Bonadio, Public Square, Watertown, N. Y.

ALASKAN hams: Viking II and VFO. Factory wired. No changes. New 6146's. $225. Plus shipping or pick-up. Tom Clark, KL7BXJ; CAA, Northway, Alaska.

SELL: HT-33, $550; SP-44 Panadaptor, $45; BC-221B & AC power supply, $65; WRL speech booster, new, $17; Rotobrake & rotator, $70; Millen SWR meter, $10; 6V-Mobile power supply, $25; 2M — Kreco ground plane, $15; Mosley — 15 & 20 Minibeams, $50; pair field phones, $30; 2M — linear amp. (L&W) 14 Mc. input, $50; Transitron Q-Probe for oscilloscope, $6; Elsco-Concirad monitor, $5; Mallard BFO, $2; E-V 600D Dynamic mike, $10. Lamb, 1219 Yardley Rd., Morrisville, Pa.

TORIODS: Uncased 88 mhy like new. Dollar each. Five, $4. PP DaPaul, 101 Starview, San Francisco, Calif.

WANTED: 6 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155 Barrington, Illinois.

FOR Sale: 600 watt, 813, Linear amplifier with 1 kilowatt power supply, includes variable Bias and regulated Screen supply, in 36" deluxe cabinet rack or casters, $140; SX-28 Hallicrafters receiver, very good and clean, $140; Model B Sideband Slicer, like new, $55 or SX-28 and Slicer, $175; BC669, 1650-4450 kc., 75 watt transceiver, original case, less power supply, $50. WØYSK, Bill Gettman, Norfolk, Nebraska.

SELL: Viking Ranger with push-to-talk in good condition, $180. HQ-100 with matching speaker & clock, $150. Like new. Edward J. Wainio, K8GSM, 120 Euclid Blvd., Youngstown 5, Ohio.

DX-100, $150, 6 Meter Communicator III, $200. K2LKI, 412 Summer Street, Schenectady 6, New York

COLLINS 75A-2 for sale, perfect working condition, $295. Bruce Travis, 760 43rd St. N.E., Cedar Rapids, Iowa.

FOR Sale: ART-13 xmitter, $125; new 2-meter Collins surplus xmitter VHF 510B, less tubes, uses 829B final, $30; 2 Motorola 2-way radios, 12 volts, single case, crystals for 147.3 Mc., $100 ea. 2 new transistor 12V power supply transformers — one 275V output at $5, one with 500V output at $7.50. W9BYX, 205 Evergreen St., Elmhurst, Illinois.

FOR Sale: Heathkit DX-35 and VFO. Both excellent condition, $70. KØKKK, 302 E. Pioneer, Shenandoah, Iowa.

KWM1 with AC and mobile power. Supplies mobile tray and Mosley mobile whip. Less than 1 year old, showroom shape. Best cash offer. No trades. No time. W. G. Budd, VE5BD, P.O. Box 696, Regina, Sask.

WANTED: SX42 or SX43. State price and condition first letter. W8PEI, Rt. 1, Powell, Ohio.

WANTED: 15 meter bandspread coil set for HRO5TA1 receiver. Jake Crumbaker, 925 Kirbert Ave., Cincinnati 5, Ohio.

COLLINS 32V2, $345, B&W 518B, $185, both gud cond. Rule, W4ZUK, 2817 N. Atlantic, Ft. Lauderdale, Fla. Tel. WE 3-2626.

LEECE NEVILLE Rectifier, $7; 110V Selsyns, $3; 500 watt Isolation transformer, $7.50; 6-425 volt Eleor Genemotor, $5; RCA 827R tube, $40. W8CKR, B. J. Kucera, 10615 So. Highland Ave., Garfield Heights 25, Ohio.

RECONDITIONED And guaranteed. Satisfaction guaranteed. Terms financed by us. Hallicrafters S38, $29; S85, $89; SX99, $119; SX30, SX100, SX101, HQ100, $139; HQ110, $189; HQ140, HQ150, National NC98, $99; NC125, $129; NC300, $279; HRO50T, HRO60, NC183D, Globe Scout, $69; Viking II, Ranger, Valiant, Pacemaker, Thunderbolt, Heath DX35, DX100, Collins 32V, 75A2, 75A3, 75A4, etc. Many other items. Write for free list. Henry Radio, Butler, Mo.

DX-100 Neatly wired and in excellent condition. Photos on request, $169. Robert Bartel, W2AWS, 198 O'Nell Street, Kingston, New York. FEderal 1-1321.

FOR Sale: Viking KW with 4 400As in final, $1000; Ranger, $175; Viking audio amplifier, $80; KW Matchbox, $90; Teirex 3EI20M 503A, $90. All equipment in excellent condition. F.o.b. Alabama. William Wood, 2002 Gorgas St., Montgomery, Ala

FOR Sale or Trade: Johnson Viking Mobile xmitter, 6V vibrator supply, Morrow 3BR converter, cables, and manuals. WANTED: Johnson Ranger or DX100. John Dorman, W8UQW, Yost Hall, Box 71, 10902 Euclid Ave., Cleveland 6, Ohio.

PACEMAKER for sale, $350. Factory reconditioned March, 1958. Excellent condition. W3DJT/2, Roger Giler, 173 Whaley Avenue, East Aurora, N. Y.

SIX meter conservative kilowatt amplifier; four kilowatt C.C.S. rating. No. TV1 my fringe area QTH. Eighty watts drive required, $250. Robert Richardson, Sterling, Virginia.

RADIOASTROMERS: AN/CPN6 X-band receiver for sale, $100. W8TKR, 1756 Graefield Rd., Birmingham, Michigan.

FOR Sale: Viking Valiant xmtr. Good condition. $300 postpaid in U. S. Lloyd G. Crosby, W7HLI, Box 394, Cascade, Mont.

FOR Sale: HQ140X receiver, speaker & manual, perfect condition, $170; Globe Chief model 90A with J38 key, 4 novice 80M crystals & manual, $55. Perfect condition. Sam Yatter, 111 Main St., Manasquan, N. J.

FIFTH Annual Syracuse VHF Roundup, October 10, 1959

FOR Sale: First certified check or money-order gets Central Electronics 20-A, with QT-1, BC458 VFO with Deluxe case and 160-10 meters modification, all like new and ready to go on the air. J. W. Knoche, W4LCR, 118 N. Cove Terrace Dr., Panama City, Fla.

NEW Six meter Kilowatt finals, $125 up. Write Richeraft Engineering, Sterling, Va.

SELL: Hallicrafters S20R, $10; NC-200, $75; 2-QF1, $10 each; 40 M and 80 M ARC5 & pwr supp., $30; DX-35 VFO mike & key, $65; 6M rig, QST April–May 1958, $25. Howard W. Miller, K20KN, 2895 Valentine Ave., Bronx 58, N. Y. Tel. WE 3-0873.

DETROIT Hams! Millen 2-6-10-11 meter exciter, never used; 800 volt 400 Ma. rack mounted power supply; two Thordarson 2.5 v. @ 20 A. CHT series filament xfrmrs; one Thordarson 1960 v. center tapped @ 400 Ma. plate transformer. One National FB-7 receiver with all coils and power supply. Old, but operates beautifully. Tremendous sacrifice. Can be seen at 16020 East Warren Ave., Detroit. Phone: TUxedo 4-4014.

ANTENNA Tuner 500W; Balun coil ant. unit; Morse keys, sounders, resonator; lot of misc. items, list on request. W6QBO, 828 Nevada, San Jose 25, Calif.

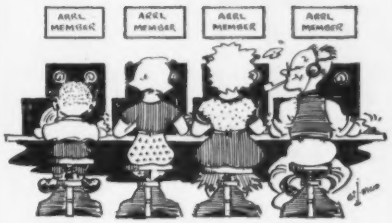
HRO Coils wanted for Grandfather HRO. Ed Brown, WØBMM, 3970 Ashby Rd., St. Ann, Mo.

POWER Supplies: PE103, new, 2 Crosley make, long cables, $25 each, includes output plug; BC1080B chassis width is 20 in. Outputs 400V at 200 Ma; 200 V at 65 Ma; 350V at 26 Ma; plus filament, $20; BC224 (older 348) as is, $30. W2YAT, Scipio Center, N. Y.

304TL transmitting tubes needed. Contact W2KUW, 64 Grand Place, Arlington, N. J.

4X150A Tubes, $9.95 each, new surplus, guaranteed, JAN specs, Signal Corps approval, H & C Sales, 666 Elaine, Pittsburgh 30, Penna.

HAM FAMILY



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"THE BOSS"... O. L. (Roy) Dewey, W1GWD. As Manager of Raytheon's Government Services Division, Roy Dewey is boss of the division's field engineers stationed around the globe. Here, in his well ordered shack, he relaxes as he talks to the Raytheon gang during a net session.

"THE SHIRT"... Al Robbins, KH6CBA. You'd be wearing something like this, too, as Raytheon's senior field engineer in old Hawaii. Al and many of the other hams in Raytheon's field engineering organization keep in touch with each other during weekly skeds on 20, 40 and 80 meters.

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RAYTHEON HAMS ON THE WAY UP KEEP IN TOUCH WITH THE BOSS THRU DX SKEDS

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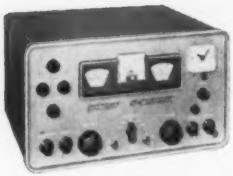
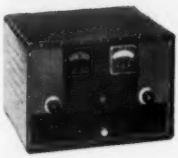
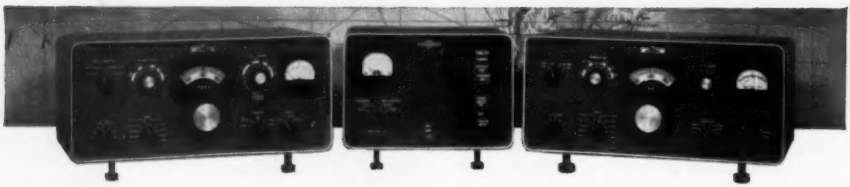


Hammarlund HQ-145C
General Coverage Receiver
$279.00



Johnson Challenger Kit
Phone-CW Transmitter (80 thru 6 meters)
$114.75

National NC-303
Amateur Band Receiver
$449.00



Collins 32S-1
SSB Transmitter—175 Watts PEP
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Collins 312B-4
Speaker Console with accessories
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Collins 75S-1
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National News Dial

Published periodically by the NATIONAL CO. INC., MALDEN 48, MASS.

NEW NATIONAL NC-303 OVERNIGHT SUCCESS!

Hams Throughout America Enthusiastic in Praise of New DeLuxe Receiver

Since its introduction in October of 1958, the new NC-303 has enjoyed overnight acceptance. National Co. distributors report "exceptionally good" sales during Christmas season, and many a lucky ham will find an NC-303 under his Christmas tree.

The NC-303 is a super-deluxe "ham band" receiver offering several exciting new features: Front panel SSB selector with exclusive, new "IF SHIFT" for instant choice of sideband . . . eliminates retuning or detuning. 5-position IF selector offers choice of sharp, SSB-1, SSB-2, medium and broad selectivity. New tone switch provides attenuation of highs, lows, or both for maximum readability.

New dual noise limiters . . . separate automatic noise limiter for AM, separate double-ended manual limiter for CW and SSB. New "Q" Multiplier with 60 db deep rejection notch, may be tuned continuously across the entire passband, has separate notch frequency and notch depth controls. New 40-1 tuning dial with logging scale, plus new fine tuning vernier dial drive for super precision CW and SSB tuning.

Exclusive new WWV converter provision . . . no interference with dial calibration or frequency coverage . . . accessory calibrator provides one microvolt sensitivity on 10 mc WWV. New "fast attack—slow release" AGC. Crystal controlled 2nd converter oscillator provides excellent inherent stability from cold start. Sensitivity less than 1.0 microvolts. 10 dial scales cover all amateur bands . . . exclusive converter provision for 6, 2, and 1¼ meters.

These are only a few of the many features. See your National Co. Distributor, or write for full specifications. Suggested list price $449.00.

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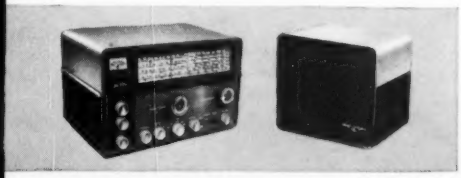

NC-109 PLUS NTS-1 SPEAKER Regularly $217.45
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Typical RCA High-Perveance Beam Power Tub

RCA Type No.	Max. DC Plate Input (watts)	Max. DC Plate Volts	Max. Freq at Max. Ratings (Mc)
2E26	40	600	125
807	75	750	60
813	500	2250	30
829-B	120†	750	200
5763	17	350	50
6146	90	750	60
7034/ 4X150A	500	2000	150
7094	500	1500	60

* Maximum Amateur Ratings, Class C CW
†Twin-Unit Tube. Total for tube

RADIO CORPORATION OF AMERICA
Electron Tube Division **Harrison, N. J.**